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```
MMM         MMM     AAAAAAAAA        CCCCCCCCCCCC  RRRRRRRRRRRR        OOOOOOOOO
MMM         MMM     AAAAAAAAA        CCCCCCCCCCCC  RRRRRRRRRRRR        OOOOOOOOO
MMM         MMM     AAAAAAAAA        CCCCCCCCCCCC  RRRRRRRRRRRR        OOOOOOOOO
MMMMMM   MMMMMM  AAA         AAA  CCC              RRR         RRR  OOO         OOO
MMMMMM   MMMMMM  AAA         AAA  CCC              RRR         RRR  OOO         OOO
MMMMMM   MMMMMM  AAA         AAA  CCC              RRR         RRR  OOO         OOO
MMM   MMM   MMM  AAA         AAA  CCC              RRR         RRR  OOO         OOO
MMM   MMM   MMM  AAA         AAA  CCC              RRR         RRR  OOO         OOO
MMM   MMM   MMM  AAA         AAA  CCC              RRR         RRR  OOO         OOO
MMM         MMM  AAA         AAA  CCC              RRRRRRRRRRRR     OOO         OOO
MMM         MMM  AAA         AAA  CCC              RRRRRRRRRRRR     OOO         OOO
MMM         MMM  AAA         AAA  CCC              RRRRRRRRRRRR     OOO         OOO
MMM         MMM  AAAAAAAAAAAAAAA  CCC              RRR   RRR        OOO         OOO
MMM         MMM  AAAAAAAAAAAAAAA  CCC              RRR   RRR        OOO         OOO
MMM         MMM  AAAAAAAAAAAAAAA  CCC              RRR   RRR        OOO         OOO
MMM         MMM  AAA         AAA  CCC              RRR      RRR     OOO         OOO
MMM         MMM  AAA         AAA  CCC              RRR      RRR     OOO         OOO
MMM         MMM  AAA         AAA  CCC              RRR      RRR     OOO         OOO
MMM         MMM  AAA         AAA     CCCCCCCCCCCC  RRR         RRR     OOOOOOOOO
MMM         MMM  AAA         AAA     CCCCCCCCCCCC  RRR         RRR     OOOOOOOOO
MMM         MMM  AAA         AAA     CCCCCCCCCCCC  RRR         RRR     OOOOOOOOO
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**FILE**ID**ACTSTA                                E  7                                                  MA
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  AAAAAA      CCCCCCCC  TTTTTTTTTT    SSSSSSSS  TTTTTTTTTT    AAAAAA
  AAAAAA      CCCCCCCC  TTTTTTTTTT    SSSSSSSS  TTTTTTTTTT    AAAAAA
AA      AA  CC              TT      SS              TT      AA      AA
AA      AA  CC              TT      SS              TT      AA      AA
AA      AA  CC              TT      SS              TT      AA      AA
AA      AA  CC              TT      SS              TT      AA      AA
AA      AA  CC              TT        SSSSSS        TT      AA      AA
AA      AA  CC              TT        SSSSSS        TT      AA      AA
AAAAAAAAAA  CC              TT              SS      TT      AAAAAAAAAA
AAAAAAAAAA  CC              TT              SS      TT      AAAAAAAAAA
AA      AA  CC              TT              SS      TT      AA      AA      ....
AA      AA  CC              TT              SS      TT      AA      AA      ....
AA      AA    CCCCCCCC      TT      SSSSSSSS        TT      AA      AA      ....
AA      AA    CCCCCCCC      TT      SSSSSSSS        TT      AA      AA      ....

LL            IIIIII      SSSSSSSS
LL            IIIIII      SSSSSSSS
LL              II      SS
LL              II      SS
LL              II      SS
LL              II      SS
LL              II        SSSSSS
LL              II        SSSSSS
LL              II              SS
LL              II              SS
LL              II              SS
LL              II              SS
LLLLLLLLLL    IIIIII    SSSSSSSS
LLLLLLLLLL    IIIIII    SSSSSSSS
```

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```

MA
V0

```
0000            .TITLE  MAC$ACTSTA MACHINE STATEMENTS
0000            .IDENT  'V04-000'
0000
0000    ;
0000    ;****************************************************************************
000C    ;*                                                                          *
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0000    ;*                                                                          *
0000    ;*                                                                          *
0000    ;****************************************************************************
0000    ;
0000
0000    ;++
0000    ; FACILITY:     VAX MACRO ASSEMBLER OBJECT LIBRARY
0000    ;
0000    ; ABSTRACT:
0000    ;
0000    ; The VAX-11 MACRO assembler translates MACRO-32 source code into object
0000    ; modules for input to the VAX-11 LINKER.
0000    ;
0000    ; ENVIRONMENT:  USER MODE
0000    ;
0000    ; AUTHOR: Benn Schreiber, CREATION DATE: 25-AUG-78
0000    ;
0000    ; MODIFIED BY:
0000    ;
0000    ;       V03-002 MTR0034         Mike Rhodes     03-Jun-1983
0000    ;               Set SYM$M_REF in the current PSECT block when
0000    ;               a .MASK directive is encountered.
0000    ;
0000    ;       V03.01  MTR0017         Mike Rhodes     07-Jun-1982
0000    ;               Re-enable FLG$V_COMPEXPR in DATARG::, which
0000    ;               was diabled when a forward reference to a
0000    ;               symbol in an expression occurred.
0000    ;
0000    ;       V02.18  BLS0063         Benn Schreiber  30-Jul-1981
0000    ;               Remove 65K store repeated check since linker
0000    ;               allows more
0000    ;
0000    ;       V02.17  PCG0004         Peter George    28-Jul-1981
0000    ;               Call DATARG from QUDSTR and OCTSTR.
```

```
0000    ;
0000    ;       V02.16  PCG0002         Peter George    05-May-1981
0000    ;               Set RELPSECT flag for all global symbol assignments
0000    ;               and for all global labels.
0000    ;
0000    ;       V02.15  CNH0042         Chris Hume      28-Oct-1980
0000    ;               De-optimize boundary valued backward references if indexing
0000    ;               requested.  Allow the architecturally legal immediate mode in
0000    ;               address and vield contexts and also the practically useless
0000    ;               indexed immediate mode.
0000    ;               (ACTREF.MAR 02.15, DEFINE.MAR 02.17, SYMTAB.MAR 02.18)
0000    ;
0000    ;       V01.14  RN0023          R. Newland       3-Nov-1979
0000    ;               New message codes to get error messages from system
0000    ;               message file.
0000    ;
0000    ;       V01.13  RN0020          R. Newland      26-Oct-1979
0000    ;               Change error message for .BLKx expression not absolute
0000    ;
0000    ;       V01.12  RN0019          R. Newland      25-Oct-1979
0000    ;               Improve error pointer positioning
0000    ;
0000    ;       V01.11  RN0014          R. Newland      14-Oct-1979
0000    ;               Support for G_floating, H_floating and Octaword data types.
0000    ;               .BLKG, .BLKH, .BLKO and .OCTA directives.
0000    ;
0000    ;       V01.10  RN0005          R. Newland      12-Aug-1979
0000    ;               Remove .ALIGN LONG statements
0000    ;
0000    ;       V01.15  RN0029          R. Newland      12-Feb-1980
0000    ;               Correct listing of branch operand when on continued line.
0000    ;
0000    ;       V01.13  RN0021          R. Newland      28-Oct-1979
0000    ;               Correct listing of .ENTRY register mask value.
0000    ;               SPR 11-26384
0000    ;
0000    ;       V01.09  0003            B. Schreiber    10-JAN-1979
0000    ;               Catch syntax error if pound sign forgotten before
0000    ;               ASCII immediate (^A) in operands.
0000    ;--
```

```
                 0000     99          .SBTTL  DECLARATIONS
                 0000    100  ;
                 0000    101  ; INCLUDE FILES:
                 0000    102  ;
                 0000    103
                 0000    104  ;
                 0000    105  ; MACROS:
                 0000    106  ;
                 0000    107
                 0000    108          $MAC_SYMBLKDEF                  ;DEFINE SYMBOL BLOCK OFFSETS
                 0000    109          $MAC_CTLFLGDEF                  ;DEFINE CONTROL FLAGS
                 0000    110          $MAC_GENVALDEF                  ;DEFINE GENERAL VALUES
                 0000    111          $MAC_INTCODDEF                  ;DEFINE INT. FILE COMMANDS
                 0000    112          $MAC_ADRMODDEF                  ;DEFINE ADDRESSING MODES
                 0000    113          $MAC_OPRDEF                     ;DEFINE OPERAND DESCRIPTOR BITS
                 0000    114          $MAC_MSGDEF                     ; Define message codes
                 0000    115
                 0000    116  ;
                 0000    117  ; EQUATED SYMBOLS:
                 0000    118  ;
                 0000    119
                 0000    120  ;
                 0000    121  ; OWN STORAGE:
                 0000    122  ;
                 0000    123
             00000000    124          .PSECT  MAC$RO_DATA,NOWRT,NOEXE,GBL,LONG
                 0000    125
                 0000    126  DAT_NUL_CMD:
           26    0000    127          .BYTE   INT$_STIB,-
                 0001    128                  INT$_STIW,-
           27    0001    129                  INT$_STIL,-
           28    0002    130                  INT$_STIL,-
           28    0003    131                  INT$_STIB,-
           26    0004    132                  INT$_STIW,-
        28 27    0005    133                  INT$_STIL
                 0007    134
                 0007    135  DAT_RPT_CMD:
                 0007    136          .BYTE   INT$_STRB,-
           2F    0007    137                  INT$_STRW,-
           30    0008    138                  INT$_STRL,-
           31    0009    139                  0,-
           00    000A    140                  INT$_STRSB,-
           32    000B    141                  INT$_STRSW,-
        00 33    000C    142                  0
                 000E    143
                 000E    144  DAT_STO_CMD:
                 000E    145          .BYTE   INT$_STOB,-
           34    000E    146                  INT$_STOW,-
           35    000F    147                  INT$_STOL,-
           2E    0010    148                  INT$_STOL,-
           2E    0011    149                  INT$_STSB,-
           36    0012    150                  INT$_STSW,-
        2E 37    0013    151                  INT$_STOL
                 0015    152
                 0015    153  DAT_TRUNC_CHK:                          ;ROUTINES TO CHECK FOR TRUNCATION
                 0015    154          .ADDRESS MAC$CK_BYT_TRU1,-      ;BYTE
    00000000'    0015    155                  MAC$CK_WRD_TRU1,-       ;WORD
```

```
                   00000000'  0019    156                          0,-                          ;LONGWORD
                   00000000'  001D    157                          0,-                          ;QUADWORD
                   00000000'  0021    158                          MAC$CK_SBY_TRU1,-            ;SIGNED BYTE
                   00000000'  0025    159                          MAC$CK_SWD_TRU1,-            ;SIGNED WORD
          00000000'00000000'  0029    160                          0                            ;OCTAWORD
                              0031    161
                              0031    162  DAT_SHIFT_FACT:                                      ;SHIFT # OF ELEMENTS OF ALLOCATION
                              0031    163                                                       ;BY THIS MUCH TO GET ALLOCATION
       04 01 00 03 02 01 00   0031    164           .BYTE      0,1,2,3,0,1,4                    ;BYTE,WORD,LONG,QUAD,SIGNED_BYTE,
                              0038    165                                                       ;SIGNED_WORD,OCTAWORD
```

```
                        0038   ;++
                        0038   ; THIS IS THE HEART OF THE MARS ASSEMBLER.  THESE ROUTINES HANDLE
                        0038   ; MACHINE INSTRUCTIONS WHICH APPEAR AS SPECIAL BLOCKS IN THE
                        0038   ; SYMBOL TABLE.  THE 'SYM$B_SEG' BYTE IS THE NUMBER OF OPERANDS
                        0038   ; THE INSTRUCTION NEEDS.  STARTING AT BYTE 'SYM$K_BLKSIZ' IS A
                        0038   ; STRING OF BYTES DESCRIBING THE OPERANDS.  THE LOW 4 BITS DEFINE
                        0038   ; THE SIZE OF THE OPERAND, THE NEXT 3 BITS ARE AN INDEX INTO THE
                        0038   ; ILLEGAL MODE TABLE, AND THE LAST BIT IS SET IF IT IS A FLOATING
                        0038   ; OPERAND.
                        0038   ;
                        0038   ;--
                        0038
                    00000000          .PSECT  MAC$RO_CODE_P1,NOWRT,GBL,LONG
                        0000
                        0000   STAT1::                                 ;STATEMENT = MACHINE_STAT
                        0000
     0000'CF    D5      0000          TSTL    W^MAC$GL_MOPNUM          ;WERE THERE ENOUGH OPERANDS?
          08    15      0004          BLEQ    10$                      ;IF LEQ YES
                        0006          $MAC_ERR NOTENUFOPR              ; No--set message code
       FFF2'    30      000B          BSBW    MAC$ERRORPT              ;SEND ERROR MSG TO INT. FILE
                05      000E   10$:   RSB
```

```
                                000F          .SBTTL  OPCODE GENERATION
                                000F
                                000F  ;++
                                000F  ; FUNCTIONAL DESCRIPTION:
                                000F  ;
                                000F  ;       MINST1 IS INVOKED WHEN AN OPCODE IS ENCOUNTERED.  IT SETS
                                000F  ;       UP TO PROCESS THE OPERANDS THAT FOLLOW THE OPCODE.
                                000F  ;
                                000F  ; INPUTS:
                                000F  ;
                                000F  ;       MAC$GL_VALUE             SYMBOL BLOCK ADDRESS OF OPCODE
                                000F  ;
                                000F  ; OUTPUTS:
                                000F  ;
                                000F  ;       MAC$GL_MOPNUM            NUMBER OF OPERANDS FOR THIS OPCODE
                                000F  ;       MAC$GL_MOPPTR            POINTER TO OPERAND WORD DESCRIPTORS
                                000F  ;
                                000F  ;--
                                000F
                                000F  MINST1::                                        ;MACHINE_INST = DOPCODE
                                000F
         56    0000'CF    D0    000F          MOVL    W^MAC$GL_VALUE,R6       ;GET SYMBOL BLOCK ADDRESS
                  FFE9'   30    0014          BSBW    MAC$CREF_OPCODE         ;CREF THE OPCODE IF NEEDED
                                0017          $INTOUT_WD INT$_OP,SYM$L_VAL(R6) ;OUTPUT OPCODE TO PASS 2
                                0021          $INC_PC                         ;UPDATE PC FOR OPCODE
                06 A6     95    0025          TSTB    SYM$L_VAL+1(R6)         ;TWO-BYTE OPCODE?
                   04     13    0028          BEQL    10$                     ;IF EQL NO
                                002A          $INC_PC                         ;YES--UPDATE PC FOR 2-BYTE OPCODE
                0C A6     9A    002E  10$:    MOVZBL  SYM$B_SEG(R6),-         ;SET UP OPERAND COUNTER
              0000'CF           0031                          W^MAC$GL_MOPNUM
                0D A6     9E    0034          MOVAB   SYM$K_BLKSIZ(R6),-      ;POINT TO OPERAND MODE WORD DESCRIPTORS
              0000'CF           0037                          W^MAC$GL_MOPPTR ;
                                003A
                                003A  ;
                                003A  ; EXIT FROM MACHINE INSTRUCTION OR OPERAND--SET FOR NEXT OPERAND
                                003A  ;
                                003A
                                003A  MACH_OP_EXIT:
                                003A                                          ; Clear Index Mode de-optimize flag,
   04 AB     1010 8F      AA    003A          bicw2   #FLG$M_UPAFLG!FLG$M_OPTVFLIDX,4(r11) ; and DUpA flag.
      06 6B      14       E5    0040          BBCC    #FLG$V_CHKLPND,(R11),5$ ;CHKL PENDING?
                                0044          $INTOUT_X INT$_CHKL             ;YES--SEND IT NOW
          05     00       EF    004A  5$:     EXTZV   #OPD$V_SIZE,#OPD$S_SIZE,- ;GET SIZE OF OPERAND
     50    0000'DF              004D          @W^MAC$GL_MOPPTR,R0             ;...
      0000'CF    50       D0    0051          MOVL    R0,W^MAC$GL_OPSIZE      ;AND STORE FOR LATER USE
            0000'CF       D4    0056  10$:    CLRL    W^MAC$GB_MODE           ;CLEAR MODE,IMODE,REG, AND IREG
            0000'CF       D0    005A          MOVL    W^MAC$GL_PSECT,-        ;START WITH CURRENT PSECT
            0000'CF             005E                          W^MAC$GL_PRMSEG ;
      0000'CF    59       D1    0061          CMPL    R9,W^MAC$GL_INTWRNPT    ;NEAR THE END OF THE INT. BUFFER?
                 03       1B    0066          BLEQU   20$                     ;IF LEQU NO
              FF95'       30    0068          BSBW    MAC$OUTFRAME            ;YES--SET UP FOR NEW BUFFER
      0000'CF    59       D0    006B  20$:    MOVL    R9,W^MAC$GL_EXPPTR      ;SAVE PTR TO EXPRESSION START
      0000'CF    59       D0    0070          MOVL    R9,W^MAC$GL_EXPEND      ;AND EXPRESSION END
       000000C4  8F       C8    0075          BISL2   #FLG$M_COMPEXPR!FLG$M_EXPOPT!FLG$M_EVALEXPR,-
                 6B             007B                          (R11)           ;ASSUME COMPILE TIME EXPRESSION,
                                007C                                          ; ALLOW EXPRESSION OPTIMIZATION
                                007C                                          ; AND EVALUATE ON PASS 2
                 0000'CF   D4  007C   246          CLRL    W^MAC$GL_ABSFLAG             ;ASSUME ABSOLUTE EXPRESSION
        0000'CF  0000'CF   D0  0080   247          MOVL    W^MAC$GL_PC,W^MAC$GL_SAVE_PC ;SAVE PC FOR ERROR RECOVERY
                 0000'CF   D4  0087   248          CLRL    W^MAC$GL_HIGH_32             ;CLEAR HI 32 BITS IN CASE QUAD OPERAND
                           05  008B   249          RSB
```

```
                              008C            .SBTTL  OPERAND GENERATION
                              008C
                              008C    ;++
                              008C    ; FUNCTIONAL DESCRIPTION:
                              008C    ;
                              008C    ;       OPRAND IS INVOKED WHEN A REFERENCE (OPERAND) HAS BEEN SCANNED.
                              008C    ;       IF THERE ARE TOO MANY OPERANDS A MESSAGE IS ISSUED TO PASS 2.
                              008C    ;       THE MODE OF THE REFERENCE IS CHECKED TO SEE IF IT IS LEGAL FOR
                              008C    ;       THIS OPERAND.  THE REFERENCE IS THEN EMITTED TO PASS 2.
                              008C    ;
                              008C    ; INPUTS:
                              008C    ;
                              008C    ;       MAC$GL_MOPPTR           POINTER TO OPERAND WORD DESCRIPTOR
                              008C    ;       MAC$GB_MODE             MODE OF OPERAND
                              008C    ;
                              008C    ; OUTPUTS:
                              008C    ;
                              008C    ;       THE INTERMEDIATE CODE FOR THIS OPERAND IS EMITTED TO THE
                              008C    ;       INTERMEDIATE FILE.
                              008C    ;
                              008C    ;--
                              008C
                              008C    OPRAND::                                        ;OPERANDS = REF
                              008C                                                    ;OPERANDS = OPERANDS DCOMMA REF
                              008C
             0000'CF     D5   008C            TSTL    W^MAC$GL_MOPNUM         ;SHOULD WE REALLY BE HERE?
                  11     14   0090            BGTR    10$                     ;IF GTR THEN CONTINUE
                              0092            $MAC_ERR TOOMNYOPND             ; Else set error message code
               FF66'     30   0097            BSBW    MAC$ERRORPX             ;SEND ERROR TO PASS 2
    0000'CF  0000'CF     D0   009A            MOVL    W^MAC$GL_SAVE_PC,W^MAC$GL_PC ;RESET PC TO NOT COUNT OPERAND
                  97     11   00A1            BRB     MACH_OP_EXIT            ;FINISH UP THIS OPERAND
        56   0000'DF     3C   00A3    10$:    MOVZWL  @W^MAC$GL_MOPPTR,R6     ;GET OPERAND DESC. WORD THIS OPRAND
             05   05     EF   00A8            EXTZV   #OPD$V_MODE,#OPD$S_MODE,- ;GET THE OPERAND MODE
             55   56          00AB                    R6,R5                   ;INTO R5
        54   0000'CF     9A   00AD            MOVZBL  W^MAC$GB_MODE,R4        ;GET OPERAND MODE WE SCANNED
   50   00000000'EF45    3C   00B2            MOVZWL  L^MAC$AW_ILLMODTB[R5],R0 ;GET TABLE ENTRY FOR ACCESS MODE
          14 50   54     E1   00BA            BBC     R4,R0,20$               ;BRANCH IF LEGAL MODE
                              00BE            $MAC_ERR ILLMODE                ; No--get message code
             05   54     91   00C3            CMPB    R4,#ACM$_REGISTER       ; Is addressing mode register?
                  05     12   00C6            BNEQ    14$                     ; No if NEQ
               FF35'     30   00C8            BSBW    MAC$ERRORPX             ;SEND ERROR TO PASS 2
                  03     11   00CB            BRB     16$
                              00CD    14$:
               FF30'     30   00CD            BSBW    MAC$ERRORPT             ; Send error to pass-2
                              00D0    16$:
                  56     D4   00D0            CLRL    R6                      ;USE ZERO DESCRIPTOR
       0000'CF    02     C0   00D2    20$:    ADDL2   #2,W^MAC$GL_MOPPTR      ;ADVANCE TO NEXT DESCRIPTOR
             0000'CF     D7   00D7            DECL    W^MAC$GL_MOPNUM         ;DECREMENT OPERAND COUNT
                  0F     12   00DB            BNEQ    30$                     ;IF NEQ THEN NOT LAST OPERAND
             0000'CF     B1   00DD            CMPW    W^MAC$GL_ERRPTX,-       ;LAST OPERAND--FIRST ON LINE?
             0000'8F          00E1                            #MAC$AB_LINEBF  ;
                  06     13   00E4            BEQL    30$                     ;IF EQL YES
                  0D     E3   00E6            BBCS    #OPF$V_LASTOPR,-        ;NO--MARK LAST OPERAND
          00 0000'CF          00E8                            W^MAC$GL_OPSIZE,30$
          04 6B   02     E0   00EC    30$:    BBS     #FLG$V_COMPEXPR,(R11),40$ ;BRANCH IF OPTIMIZABLE
          0D 6B   07     E5   00F0            BBCC    #FLG$V_EXPOPT,(R11),50$ ;ELSE FLAG UNABLE TO OPTIMIZE
          09 6B   07     E1   00F4    40$:    BBC     #FLG$V_EXPOPT,(R11),50$ ;BRANCH IF UNABLE TO OPTIMIZE
          FF05'  30  00F8   308          BSBW    MAC$OPTIMIZEXPR           ;OPTIMIZE EXPRESSION
             0C  E3  00FB   309          BBCS    #OPF$V_OPTEXP,-           ;MARK OPTIMIZED
     00 0000'CF      00FD   310                       W^MAC$GL_OPSIZE,50$
   00A1 8F   56  B1  0101   311 50$:     CMPW    R6,#OPD$M_BB              ;BRANCH DESTINATION?
             0E  13  0106   312          BEQL    60$                       ;IF EQL YES
   00C2 8F   56  B1  0108   313          CMPW    R6,#OPD$M_BW              ;BRANCH DESTINATION?
             03  13  010D   314          BEQL    55$                       ;IF EQL YES
           008E  31  010F   315          BRW     120$                      ;ELSE NOT A BRANCH DESTINATION
                     0112   316 55$:     $INC_PC                           ;YES--UPDATE PC FOR BRANCH WORD
   0F    0000'CF 91  0116   317 60$:     CMFB    W^MAC$GB_VAL3,#REG$_PC    ;REGISTER MUST BE 'PC'
             0B  13  011B   318          BEQL    70$                       ;IF EQL OK
                     011D   319          $MAC_ERR ILLBRDEST                ; Illegal branch destination
          FEDB'  30  0122   320          BSBW    MAC$ERRORPX               ;SEND ERROR TO PASS 2
           00F4  31  0125   321          BRW     150$                      ;FINISH
   0A    0000'CF 91  0128   322 70$:     CMPB    W^MAC$GB_MODE,#ADM$_BYTE_DISP ;CORRECT BRANCH SIZE
             06  12  012D   323          BNEQ    80$
                     012F   324          $DEC_PC                           ;
             13  11  0133   325          BRB     100$                      ;!OIN COMMON CODE
   0C    0000'CF 91  0135   326 80$:     CMPB    W^MAC$GB_MODE,#ADM$_WORD_DISP
             07  12  013A   327          BNEQ    90$
                     013C   328          $DEC_PC #2
             05  11  0141   329          BRB     100$
                     0143   330 90$:     $DEC_PC #4
             7E  94  0148   331 100$:    CLRB    -(SP)                     ;ASSUME NOT OPTIMIZED
   53    0000'CF D0  014A   332          MOVL    W^MAC$GL_EXPOPVL1,R3      ;GET (MAYBE) OPTIMIZED VALUE
     37 6B   07  E0  014F   333          BBS     #FLG$V_EXPOPT,(R11),110$ ;BRANCH IF WE OPTIMIZED
             53  D4  0153   334          CLRL    R3                        ;ASSUME GLOBAL
   52    0000'CF D0  0155   335          MOVL    W^MAC$GL_EXPPTR,R2        ;GET EXPRESSION POINTER
50 0000'CF   52  C3  015A   336          SUBL3   R2,W^MAC$GL_EXPEND,R0     ;COMPUTE SIZE OF EXPRESSION
                     0160   337 104$:
             28  13  0160   338          BEQL    110$                      ;IF EQL NO EXPRESSION
        06   50  D1  0162   339          CMPL    R0,#6                     ;6 BYTES?
             11  13  0165   340          BEQL    106$                      ; Yes if EQL
     17   01 A2  91  0167   341          CMPB    1(R2),#INT$_NEWL          ; Is it a new-line?
             1D  12  016B   342          BNEQ    110$                      ; No if NEQ
        51   62  9A  016D   343          MOVZBL  (R2),R1                   ; Get frame length
        52   51  C0  0170   344          ADDL2   R1,R2                     ; Point to next frame
        50   51  C2  0173   345          SUBL2   R1,R0                     ; and reduce size of expression
             E8  11  0176   346          BRB     104$
                     0178   347 106$:
     2D   01 A2  91  0178   348          CMPB    1(R2),#INT$_STKS          ;YES--STACK SYMBOL REFERENCE?
             0C  12  017C   349          BNEQ    110$                      ;IF NEQ NO
     53   02 A2  D0  017E   350          MOVL    2(R2),R3                  ;YES--GET ID ADDRESS
   6E    0000'CF 90  0182   351          MOVB    W^MAC$GL_PSECT,(SP)       ;MUST BE IN SAME PSECT
          02 A2  D4  0187   352          .LRL    2(R2)                     ;FLAG SPECIAL RESOLUTION
        50   09  9A  018A   353 110$:    MOVZBL  #9,R0                     ;WE WILL OUTPUT 9 BYTES
          FE70'  30  018D   354          BSBW    MAC$INTOUT_N              ;MAKE ROOM FOR THEM
        89   0E  90  0190   355          MOVB    #INT$_BDST,(R9)+          ;STORE INT. CODE
   89    0000'CF B0  0193   356          MOVW    W^MAC$GL_OPSIZE,(R9)+     ;STORE FLAGS
        89   53  D0  0198   357          MOVL    R3,(R9)+                  ;STORE 0 OR SYMBOL ID ADDRESS
        89   8E  90  019B   358          MOVB    (SP)+,(R9)+               ;STORE 0 OR PSECT NUMBER
             7C  11  019E   359          BRB     150$
                     01A0   360 ;
                     01A0   361 ; NOT BRANCH DESTINATION
                     01A0   362 ;
     14 6B   24  E1  01A0   363 120$:    BBC     #FLG$V_UPAFLG,(R11),125$ ;BRANCH IF DUPA WAS NOT SEEN
   0F    0000'CF 91  01A4   364          CMPB    W^MAC$GB_REG,#REG$_PC     ;YES--IS REGISTER PC?
```

```
          0D    12  01A9    365          BNEQ    125$                       ;IF NEQ NO
      0A  54    91  01AB    366          CMPB    R4,#ADM$_BYTE_DISP         ;YES--IS MODE LEGAL?
          08    19  01AE    367          BLSS    125$                       ;IF LSS YES
                    01B0    368          $MAC_ERR OPRNDSYNX                 ;NO--TELL OF OPERAND SYNTAX ERROR
       FE48'    30  01B5    369          BSBW    MAC$ERRORPT                ;...
   1A 6B  07    E1  01B8    370 125$:    BBC     #FLG$V_EXPOPT,(R11),130$ ;BRANCH IF CANNOT OPTIMIZE
      50  0C    9A  01BC    371          MOVZBL  #12,R0                     ;SET TO STORE 12 BYTES
       FE3E'    30  01BF    372          BSBW    MAC$INTOUT_N               ;SET UP FOR IT
      89  1E    90  01C2    373          MOVB    #INT$_REF,(R9)+            ;STORE INT. CODE
 89  0000'CF    D0  01C5    374          MOVL    W^MAC$GL_VALUE,(R9)+       ;STORE REGISTERS/MODES
 89  0000'CF    B0  01CA    375          MOVW    W^MAC$GL_OPSIZE,(R9)+      ;STORE FLAGS
 89  0000'CF    D0  01CF    376          MOVL    W^MAC$GL_EXPOPVL1,(R9)+ ;STORE OPTIMIZED VALUE
          13    11  01D4    377          BRB     140$
      50  08    9A  01D6    378 130$:    MOVZBL  #8,R0                      ;SET TO STORE 8 BYTES
       FE24'    30  01D9    379          BSBW    MAC$INTOUT_N               ;SET UP FOR IT
      89  1E    90  01DC    380          MOVB    #INT$_REF,(R9)+            ;STORE INT. CODE
 89  0000'CF    D0  01DF    381          MOVL    W^MAC$GL_VALUE,(R9)+       ;STORE MODES/REGISTERS
 89  0000'CF    B0  01E4    382          MOVW    W^MAC$GL_OPSIZE,(R9)+      ;STORE FLAGS
                    01E9    383 140$:
 01  0000'CF    91  01E9    384          CMPB    W^MAC$GL_VALUE,#ADM$_IMMEDIATE ; Is address mode immediate?
          2C    12  01EE    385          BNEQ    150$                       ; No if NEQ
 08  0000'CF    91  01F0    386          CMPB    W^MAC$GL_OPSIZE,#8         ; Is operand a QUAD or OCTA value?
          25    19  01F5    387          BLSS    150$                       ; No if LSS
                    01F7    388          $INTOUT_LW INT$_STIL,<W^MAC$GL_HIGH_32> ; Output bits 32-63
 10  0000'CF    91  0201    389          CMPB    W^MAC$GL_OPSIZE,#16        ; Is operand an OCTA value?
          14    12  0206    390          BNEQ    150$                       ; No if NEQ
                    0208    391          $INTOUT_LW INT$_STIL,<W^MAC$GQ_HIGH_64+0> ; Output bits 64-95
                    0212    392          $INTOUT_LW INT$_STIL,<W^MAC$GQ_HIGH_64+4> ; and then bits 96-127
 0000'CF  02    90  021C    393 150$:    MOVB    #RDX$V_DECIMAL,W^MAC$GB_RDXNDX ;RESET RADIX
        FE16    31  0221    394          BRW     MACH_OP_EXIT
```

```
                         0224                 .SBTTL  ASSIGNMENT STATMENTS
                         0224
                         0224         ;++
                         0224         ; FUNCTIONAL DESCRIPTION:
                         0224         ;
                         0224         ;       THESE ROUTINES ARE INOVKED WHEN AN ASSIGNMENT STATMENT
                         0224         ;       IS DETECTED.  IF ENTRY AT ASSHD3, IT IS FLAGGED AS AN
                         0224         ;       ASSIGNMENT TO 'PC'.  IF ENTRY AT ASSHD2, THE SYMBOL
                         0224         ;       IS FLAGGED AS GLOBAL.
                         0224         ;
                         0224         ; INPUTS:
                         0224         ;
                         0224         ;       MAC$AL_VALSTACK-8[R7]   (ASSHD2) SYMBOL BLOCK OF ID
                         0224         ;       MAC$AL_VALSTACK-4[R7]   (ASSHD1) SYMBOL BLOCK OF ID
                         0224         ;
                         0224         ; OUTPUTS:
                         0224         ;
                         0224         ;       MAC$GL_ASNPTR           POINTER TO SYMBOL BLOCK OF ID
                         0224         ;       MAC$GL_OPSIZE           4
                         0224         ;
                         0224         ;--
                         0224
                         0224
                         0224         ASSHD3::                                      ;ASSIGN_HEAD = DPC
      50   FF 8F    98   0224                 CVTBL   #-1,R0                        ;MARK PC AUGMENTATION
              18    11   0228                 BRB     ASSIGN_HEAD
                         022A
                         022A         ASSHD2::                                      ;ASSIGN_HEAD = ID DEQ DEQ
   50   FFF8'CF47   D0   022A                 MOVL    W^MAC$AL_VALSTACK-8[R7],R0 ;POINT TO ID SYMBOL BLOCK
       09 A0    04  A8   0230                 BISW2   #SYM$M_GLOBL,SYM$W_FLAG(R0) ;MARK SYMBOL AS GLOBAL
 09 A0   0800 8F    A8   0234                 BISW2   #SYM$M_RELPSECT,SYM$W_FLAG(R0)  ;ALWAYS OUTPUT GLOBAL SYMBOL
              06    11   023A                 BRB     ASSIGN_HEAD
                         023C
                         023C         ASSHD1::                                      ;ASSIGN_HEAD = ID DEQ
   50   FFFC'CF47   D0   023C                 MOVL    W^MAC$AL_VALSTACK-4[R7],R0 ;POINT TO ID SYMBOL BLOCK
                         0242         ASSIGN_HEAD:
    0000'CF     50  D0   0242                 MOVL    R0,W^MAC$GL_ASNPTR            ;SAVE POINTER TO ID
         0000'CF    D4   0247                 CLRL    W^MAC$GL_PRMSEG               ;ALLOW EXPRESSION IN ANY SEGMENT
     00 6B      06  E5   024B                 BBCC    #FLG$V_EVALEXPR,(R11),10$ ;DON'T EVALUATE EXPRESSION
     00002004 8F    C8   024F         10$:    BISL2   #FLG$M_COMPEXPR!FLG$M_OPRND,- ;ASSUME COMPILE TIME EXPR
              6B         0255                                 (R11)             ;AND FLAG IN OPERAND FIELD
         0000'CF    D4   0256                 CLRL    W^MAC$GL_ABSFLAG              ;ASSUME ABSOLUTE EXPRESSION
    0000'CF     04  9A   025A                 MOVZBL  #4,W^MAC$GL_OPSIZE            ;SET OPERAND MAX SIZE TO 4 BYTES
                         025F         ;
                         025F         ; IF CREFFING, SAVE LINE/PAGE SO THEY ARE CORRECT
                         025F         ;
      21 6B     1E  E1   025F                 BBC     #FLG$V_CRF,(R11),30$          ;BRANCH IF NOT CREFFING
         0000'CF    D0   0263                 MOVL    W^MAC$GL_SRCPAG,-             ;YES--SAVE SOURCE PAGE
         0000'CF         0267                         W^MAC$GL_SAV_PAG
         0000'CF    D0   026A                 MOVL    W^MAC$GL_LINBAS,-             ;SAVE LINE BASE
         0000'CF         026E                         W^MAC$GL_SAV_BAS
    50   0000'CF    D0   0271                 MOVL    W^MAC$GL_LINENUM,R0           ;GET THE LINF NUMBER
      05 6B     19  E1   0276                 BBC     #FLG$V_SEQFIL,(R11),20$ ;BRANCH IF NOT SEQUENCED
    50   0000'CF    D0   027A                 MOVL    W^MAC$GL_RECHDBUF,R0          ;YES--GET SEQUENCE NUMBER
    0000'CF     50  D0   027F         20$:    MOVL    R0,W^MAC$GL_SAV_LIN           ;AND SAVE LINE NUMBER
                    05   0284         30$:    RSB
```

```
                            0285  ;++
                            0285  ; FUNCTIONAL DESCRIPTION:
                            0285  ;
                            0285  ;       ASSGN1 IS INVOKED TO FINISH PROCESSING AN ASSIGNMENT STATEMENT.
                            0285  ;       THE EXPRESSION HAS BEEN EVALUATED, AND IS ON THE VALUE STACK.
                            0285  ;       IF THE ASSIGNMENT IS TO THE PC, CODE IS EMITTED TO THE INTERMEDIATE
                            0285  ;       FILE TO AUGMENT THE PC.  IF THE ASSIGNMENT IS NOT TO PC, A
                            0285  ;       CHECK IS MADE FOR A MULTIPLE LABEL DEFINITION, AND THEN THE
                            0285  ;       FLAGS IN THE SYMBOL BLOCK ARE UPDATED.  CODE IS EMITTED TO
                            0285  ;       THE INTERME)IATE FILE TO UPDATE THE SYMBOL BLOCK IN PASS 2.
                            0285  ;
                            0285  ; INPUTS:
                            0285  ;
                            0285  ;       MAC$GL_ASNPTR           (-1) IF PC AUGMENTATION, ELSE POINTER
                            0285  ;                               TO SYMBOL BLOCK OF ID.
                            0285  ;       MAC$AL_VALSTACK-4[R7]   EXPRESSION VALUE
                            0285  ;
                            0285  ; OUTPUTS:
                            0285  ;
                            0285  ;
                            0285  ;--
                            0285
                            0285  ASSGN1::                                ;ASSIGNMENT = ASSIGN HEAD EXPR DEOL
       56   0000'CF   D0    0285          MOVL    W^MAC$GL_ASNPTR,R6      ;GET POINTER TO ID SYMBOL BLOCK
         08 6B   02   E0    028A          BBS     #FLG$V_COMPEXPR,(R11),10$ ;MUST BE COMPILE TIME EXPRESSION
                            028E          $MAC_ERR ASGNMNTSYN             ; No--send message to pass 2
            FD6A'     30    0293          BSBW    MAC$ERRORPT
      50   56   01    C1    0296  10$:    ADDL3   #1,R6,R0                ;IS THIS PC ASSIGNMENT (R6=-1?)?
                22    12    029A          BNEQ    20$                     ;IF NEQ NO
             FD61'    30    029C          BSBW    MAC$SET_PC              ;YES--RECORD HI MARK OF PC
     56   FFFC'CF47   D0    029F          MOVL    W^MAC$A[_VALSTACK-4[R7],R6 ;GET NEW VALUE
  55   56   0000'CF   C3    02A5          SUBL3   W^MAC$GL_PC,R6,R5       ;COMPUTE AUGMENTATION
                            02AB          $INTOUT_LW INT$_AUGPC,R5        ;SEND TO PASS 2
       0000'CF   56   D0    02B3          MOVL    R6,W^MAC$GL_PC          ;SET NEW PC
             FD45'    30    02B8          BSBW    MAC$SET_PC              ;CHECK NEW PC
             008D     31    02BB          BRW     80$                     ;
                            02BE  ;
                            02BE  ; EXPRESSION DOES NOT INVOLVE PC
                            02BE  ;
     08 09 A6   03    E1    02BE  20$:    BBC     #SYM$V_EXTRN,SYM$W_FLAG(R6),30$ ;EXTERNAL?
                            02C3          $MAC_ERR SYMDC[EXTR             ; Yes-error
             FD35'    30    02C8          BSBW    MAC$ERRORPT             ;ISSUE ERROR TO PASS 2
             00AE     30    02CB  30$:    BSBW    MAC$MUL_DEF_CHK         ;SEE IF MULTIPLY DEFINED
    0C A6   0000'CF   90    02CE          MOVB    W^MAC$G[_PRMSEG,SYM$B_SEG(R6) ;DEFINE IN EXPRESSION PSECT
        09 A6   10    AA    02D4          BICW2   #SYM$M_ABS,SYM$W_FLAG(R6) ;ASSUME NOT ABSOLUTE
          0000'CF     D5    02D8          TSTL    W^MAC$GL_ABSFLAG        ;IS EXPRESSION ABSOLUTE?
                08    12    02DC          BNEQ    50$                     ;IF NEQ NO
             0C A6    94    02DE          CLRB    SYM$B_SEG(R6)           ;YES--MAKE ABSOLUTE PSECT
     00 09 A6   04    E3    02E1          BBCS    #SYM$V_ABS,SYM$W_FLAG(R6),50$ ;SET ABSOLUTE FLAG
     09 09 A6   06    E0    02E6  50$:    BBS     #SYM$V_LOCAL,SYM$W_FLAG(R6),60$ ;IS SYMBOL LOCAL?
       04 0005'CF     E9    02EB          BLBC    W^ENB$G_DEBUG+SYM$[_VAL,60$     ;NO--BRANCH IF NO ENABLE DEBUG
        09 A6   20    A8    02F0          BISW2   #SYM$M_DEBUG,SYM$W_FLAG(R6) ;LET DEBUGGER KNOW ABOUT SYMBOL
  05 A6   FFFC'CF47   D0    02F4  60$:    MOVL    W^MAC$AL_VALSTACK-4[R7],- ;PUT IN SYMBOL VALUE
                            02FB                          SYM$L_VAL(R6)
          0101 8F     A8    02FB          BISW2   #SYM$M_DEF!SYM$M_ASN,-  ;MARK AS DEFINED BY ASSIGNMENT
             09 A6          02FF                          SYM$W_FLAG(R6)
      55    00'8F     9A    0301          MOVZBL  #CRF$K_DEF,R5           ;SET DEFINITION FLAG
```

```
         0000'CF    DD  0305    510          PUSHL   W^MAC$GL_LINBAS         ;GET READY TO SET RIGHT LINE/PAGE
         0000'CF    DD  0309    511          PUSHL   W^MAC$GL_LINENUM        ;BY SAVING CURRENT VALUES
         0000'CF    DD  030D    512          PUSHL   W^MAC$GL_SRCPAG         ;...
         0000'CF    DD  0311    513          PUSHL   W^MAC$GL_RECHDBUF
         0000'CF    DO  0315    514          MOVL    W^MAC$GL_SAV_BAS,-      ;NOW SET VALUES WE WANT
         0000'CF        0319    515                  W^MAC$GL_LINBAS
   50    0000'CF    DO  031C    516          MOVL    W^MAC$GL_SAV_LIN,RO
  0000'CF     50    DO  0321    517          MOVL    RO,W^MAC$GL_LINENUM
  0000'CF     50    DO  0326    518          MOVL    RO,W^MAC$GL_RECHDBUF    ;(IN CASE SEQUENCED FILE)
         0000'CF    DO  032B    519          MOVL    W^MAC$GL_SAV_PAG,-
         0000'CF        032F    520                  W^MAC$GL_SRCPAG
            FCCB'   30  0332    521          BSBW    MAC$CREF_SYM            ;OUTPUT TO CREF IF CREFFING
         0000'CF  8EDO  0335    522          POPL    W^MAC$GL_RECHDBUF       ;RESTORE OLD LINES/PAGES
         0000'CF  8EDO  033A    523          POPL    W^MAC$GL_SRCPAG         ;
         0000'CF  8EDO  033F    524          POPL    W^MAC$GL_LINENUM        ;
         0000'CF  8EDO  0344    525          POPL    W^MAC$GL_LINBAS         ;
              10    10  0349    526          BSBB    MAC$INTOUT_ASN          ;OUTPUT ASN TO INTERMED. FILE
   00 6B      06    E3  034B    527 80$:     BBCS    #FLG$V_EVA[EXPR,(R11),90$ ;ALLOW EXPRESSION EVALUATION
                        034F    528 90$:     $INTOUT_LW INT$_PRIL,<W^MAC$AL_VALSTACK-4[R7]> ;PRINT EXPRESSION
                    05  035A    529          RSB
```

```
                              035B  ;++
                              035B  ; FUNCTIONAL DESCRIPTION:
                              035B  ;
                              035B  ;       THIS ROUTINE OUTPUTS AN ASSIGN COMMAND AND DATA TO THE
                              035B  ;       INTERMEDIATE FILE.
                              035B  ;
                              035B  ; INPUTS:
                              035B  ;
                              035B  ;       R6      POINTS TO SYMBOL BLOCK
                              035B  ;
                              035B  ;--
                              035B
                              035B  MAC$INTOUT_ASN::
              50     0C   9A  035B          MOVZBL  #12,R0                  ;SIZE OF AN ASN COMMAND AND DATA
                  FC9F'   30  035E          BSBW    MAC$INTOUT_N            ;MAKE ROOM FOR IT
              89     0C   90  0361          MOVB    #INT$_ASN,(R9)+         ;STORE THE COMMAND
              89     56   D0  0364          MOVL    R6,(R9)+                ;STORE SYMBOL BLOCK ADDRESS
          89     0C A6    90  0367          MOVB    SYM$B_SEG(R6),(R9)+     ;STORE SYMBOL SEGMENT
          89     05 A6    D0  036B          MOVL    SYM$L_VAL(R6),(R9)+     ;STORE SYMBOL VALUE
                     50   D4  036F          CLRL    R0                      ;ASSUME ABSOLUTE
       02 09 A6      04   E0  0371          BBS     #SYM$V_ABS,SYM$W_FLAG(R6),10$ ;BRANCH IF ABSOLUTE
                     50   D6  0376          INCL    R0                      ;NO--MAKE RELOCATABLE
              89     50   90  0378  10$:    MOVB    R0,(R9)+                ;STORE ABS/REL FLAG
                          05  037B          RSB
                              037C
                              037C  ;++
                              037C  ; FUNCTIONAL DESCRIPTION:
                              037C  ;
                              037C  ;       THIS ROUTINE CHECKS FOR A MULTIPLY DEFINED LABEL.  IF THE
                              037C  ;       LABEL IS MULTIPLY DEFINED, AN ERROR MESSAGE IS ISSUED TO
                              037C  ;       PASS 2.
                              037C  ;
                              037C  ; INPUTS:
                              037C  ;
                              037C  ;       R6      SYMBOL BLOCK ADDRESS
                              037C  ;
                              037C  ;--
                              037C
                              037C  MAC$MUL_DEF_CHK::
       0D 09 A6      00   E1  037C          BBC     #SYM$V_DEF,SYM$W_FLAG(R6),10$ ;BRANCH IF NOT DEFINED
       08 09 A6      08   E0  0381          BBS     #SYM$V_ASN,SYM$W_FLAG(R6),10$ ;BRANCH IF BY ASSIGNMENT
                              0386          $MAC_ERR MULDEFLBL              ; This is multiply defined
                  FC72'   31  038B          BRW     MAC$ERRORPT             ;ISSUE ERROR TO PASS 2
          06 0005'CF      E9  038E  10$:    BLBC    W^ENB$G_SUPPRESS+SYM$L_VAL,20$ ;BRANCH IF NOT ENABLE SUPPRESSION
     09 A6   4000 8F      A8  0393          BISW2   #SYM$M_SUPR,SYM$W_FLAG(R6) ;YES--SET SUPPRESS BIT THIS SYMBOL
                          05  0399  20$:    RSB
```

```
                       039A  578         .SBTTL  BLOCK DATA STORAGE DIRECTIVES
                       039A  579
                       039A  580 ;++
                       039A  581 ; FUNCTIONAL DESCRIPTION:
                       039A  582 ;
                       039A  583 ;       THESE ROUTINES (BLKBYT, BLKWRD, BLKLNG, BLKQUD AND BLKOCT) ARE
                       039A  584 ;       CALLED WHEN A BLOCK DATA DIRECTIVE IS SCANNED.  THE
                       039A  585 ;       SHIFT COUNT FOR THE PARTICULAR DATA TYPE IS SET INTO
                       039A  586 ;       MAC$GL_VALUE AND FLAGS ARE SET TO SCAN THE EXPRESSION
                       039A  587 ;       INDICATED THE NUMBER OF UNITS OF STORAGE TO ALLOCATE.
                       039A  588 ;
                       039A  589 ; OUTPUTS:
                       039A  590 ;
                       039A  591 ;       MAC$GL_VALUE    SHIFT COUNT TO SHIFT NUMBER OF UNITS INTO BYTES
                       039A  592 ;       MAC$GL_FLAGS    FLG$M_COMPEXPR IS SET (LOOK FOR COMPILE TIME EXPRESSION
                       039A  593 ;                       FLG$M_EVALEXPR IS CLEARED (DON'T EVALUATE ON PASS 2)
                       039A  594 ;
                       039A  595 ;--
                       039A  596
                       039A  597         .ENABL  LSB
                       039A  598
                       039A  599 BLKBYT::                                ;BLOCK_TYPE = KBLKB
           0D     10   039A  600         BSBB    10$                     ;GO TO COMMON ROUTINE
                  00   039C  601         .BYTE   0                       ;SHIFT ALLOCATION 0
                       039D  602
                       039D  603 BLKWRD::                                ;BLOCK_TYPE = KBLKW
           0A     10   039D  604         BSBB    10$                     ;GO TO COMMON ROUTINE
                  01   039F  605         .BYTE   1                       ;SHIFT ALLOCATION ONCE
                       03A0  606
                       03A0  607 BLKLNG::                                ;BLOCK_TYPE = KBLKL
                       03A0  608                                         ;       OR    KLBKA
                       03A0  609                                         ;       OR    KBLKF
           07     10   03A0  610         BSBB    10$                     ;GO TO COMMON ROUTINE
                  02   03A2  611         .BYTE   2                       ;SHIFT ALLOCATION TWICE
                       03A3  612
                       03A3  613 BLKQUD::                                ;BLOCK_TYPE = KBLKQ
                       03A3  614                                         ;       OR    KBLKD
                       03A3  615                                         ;       OR      KBLKG
           04     10   03A3  616         BSBB    10$                     ;GO TO COMMON ROUTINE
                  03   03A5  617         .BYTE   3                       ;SHIFT ALLOCATION THREE TIMES
                       03A6  618
                       03A6  619 BLKOCT::                                ;BLOCK TYPE = KBLKO
                       03A6  620                                         ;       OR    KBLKH
           01     10   03A6  621         BSBB    10$                     ;GOTO COMMON ROUTINE
                  04   03A8  622         .BYTE   4                       ;SHIFT ALLOCATION FOUR TIMES
                       03A9  623
 0000'CF     9E   9A   03A9  624 10$:    MOVZBL  @(SP)+,W^MAC$GL_VALUE   ;SET SHIFT COUNT AS VALUE
      6B     04   C8   03AE  625         BISL2   #FLG$M_COMPEXPR,(R11)   ;LOOK FOR COMPILE TIME EXPRESSION
   00 6B     06   E5   03B1  626         BBCC    #FLG$V_EVALEXPR,(R11),.+1 ;DON'T OUTPUT EXPRESSION TO PASS 2
    0000'CF       D4   03B5  627         CLRL    W^MAC$GL_ABSFLAG        ;LOOK FOR ABSOLUTE EXPRESSION
                  05   03B9  628         RSB
                       03BA  629
                       03BA  630         .DSABL  LSB
```

```
                          03BA  ;++
                          03BA  ; FUNCTIONAL DESCRIPTION:
                          03BA  ;
                          03BA  ;       THESE TWO ROUTINES (BSTAT1 AND BSTAT2) FINISH PROCESSING OF
                          03BA  ;       BLOCK DATA DIRECTIVES.
                          03BA  ;
                          03BA  ;--
                          03BA
                          03BA          .ENABL  LSB
                          03BA
                          03BA  BSTAT1::                                      ;BLOCK_STAT = BLOCK_TYPE
            56    01  9A  03BA          MOVZBL  #1,R6                         ;DEFAULT ALLOCATION IS 1 UNIT
   55   0000'CF47     D0  03BD          MOVL    W^MAC$AL_VALSTACK[R7],R5;GET THE SHIFT COUNT
                  0C  11  03C3          BRB     10$
                          03C5
                          03C5  BSTAT2::                                      ;BLOCK_STAT = BLOCK_TYPE EXPR
   56   0000'CF47     D0  03C5          MOVL    W^MAC$AL_VALSTACK[R7],R6;GET NUMBER OF UNITS OF ALLOCATION
   55   FFFC'CF47     D0  03CB          MOVL    W^MAC$AL_VALSTACK-4[R7],R5 ;GET THE SHIFT COUNT
               FC2C'  30  03D1  10$.    BSBW    MAC$SET_PC                    ;RECORD HIGH PC
          0000'CF     D5  03D4          TSTL    W^MAC$GL_ABSFLAG              ;EXPRESSION MUST BE ABSOLUTE
                  0A  13  03D8          BEQL    20$                           ;IF EQL IT IS
                          03DA          $MAC_ERR BLKEXPNABS                   ; Set message code
               FC1E'  30  03DF          BSBW    MAC$ERRORPT                   ;ISSUE MESSAGE TO PASS 2
                  55  7C  03E2          CLRQ    R5                            ;ALLOCATE NO SPACE
     56     56    55  78  03E4  20$:    ASHL    R5,R6,R6                      ;CONVERT ALLOCATION TO BYTES
                          03E8          $INTOUT_LW INT$_AUGPC,R6              ;AUGMENT PC BY THAT MANY BYTES
                          03F0          $INC_PC R6                            ;INCREMENT PC FOR PASS 1 ALSO
                          03F5          $INTOUT_LW INT$_PRIL,<W^MAC$GL_PC> ;LIST NEW PC
       00 6B      06  E3  03FF          BBCS    #FLG$V_EVALEXPR,(R11),30$ ;ALLOW EXPRESSION EVALUATION ON PASS 2 AGA
                      05  0403  30$:    RSB
                          0404
                          0404          .DSABL  LSB
```

```
                             0404          .SBTTL  LABEL DEFINITIONS
                             0404
                             0404          .ENABL  LSB
                             0404
                             0404     ;++
                             0404     ; FUNCTIONAL DESCRIPTION:
                             0404     ;
                             0404     ;        THESE ROUTINES DEFINE LABELS.  IF ENTRY IS AT LBL2 THE LABEL
                             0404     ;        IS DEFINED GLOBALLY. IF ENTRY IS AT LBL1 THE LABEL IS DEFINED
                             0404     ;        AS A LOCAL LABEL.
                             0404     ;
                             0404     ; INPUTS:
                             0404     ;
                             0404     ;        MAC$AL_VALSTACK-8[R7]    (LBL2) SYMBOL BLOCK ADDRESS OF ID
                             0404     ;        MAC$AL_VALSTACK-4[R7]    (LBL1) SYMBOL BLOCK ADDRESS OF ID
                             0404     ;
                             0404     ; OUTPUTS:
                             0404     ;
                             0404     ;        MAC$GL_LSB                  INCREMENTED IF NOT LOCAL LABEL
                             0404     ;                                    AND 'ENABL LSB'
                             0404     ;
                             0404     ;--
                             0404
                             0404          .ENABL  LS^
                             0404
                             0404 LBL2::                                      ;LABEL = 'D DCOLON DCOLON
     56   FFF8'CF47    D0    0404          MOVL    W^MA(.$AL_VALSTACK-8[R7],R6 ;POINT TO ID SYMBOL BLOCK
        09 A6   04     A8    040A          BISW2   #SYM$M_GLOBL,SYM$W_FLAG(R6) ;MARK AS GLOBAL SYMBOL
  09 A6    0800 8F     A8    040E          BISW2   #SYM$M_RELPSECT,SYM$W_FLAG(R6)  ;ALWAYS OUTPUT GLOBAL SYMBOL
                06     11    0414          BRB     10$
                             0416
                             0416 LBL1::                                      ;LABEL = ID DCOLON
     56   FFFC'CF47    D0    0416          MOVL    W^MAC$AL_VALSTACK-4[R7],R6 ;POINT TO ID SYMBOL BLOCK
                             041C 10$:
                             041C LBL_X:                                      ;ENTRY FOR .ENTRY
     12 09 A6   06     E0    041C          BBS     #SYM$V_LOCAL,SYM$W_FLAG(R6),30$ ;BRANCH IF LOCAL SYMBOL
        03 0005'CF     E8    0421          BLBS    W^ENB$G_LOCALSYMB+SYM$L_VAL,20$ ;BRANCH IF ENABLE LSB
             FBD7'     30    0426          BSBW    MAC$SET_NEW_LSB             ;NO--MAKE A NEW LSB
        05 0005'CF     E9    0429 20$:     BLBC    W^ENB$G_DEBUG+SYM$L_VAL,30$ ;BRANCH IF NO ENABLE DEBUG
     00 09 A6   05     E3    042E          BBCS    #SYM$V_DEBUG,SYM$W_FLAG(R6),30$ ;NO--TELL DEBUGGER ABOUT SYMBOL
     08 09 A6   00     E1    0433 30$:     BBC     #SYM$V_DEF,SYM$W_FLAG(R6),40$ ;SYMBOL ALREADY DEFINED?
                             0438          $MAC_ERR MULDEFLBL                 ; Yes--send message
             FBC?'     30    043D          BSBW    MAC$ERRORPT                ;
     08 09 A6   03     E1    0440 40$:     BBC     #SYM$ '_EXTRN,SYM$W_FLAG(R6),50$ ;IS SYMBO'. EXTERNAL?
                             0445          $MAC_ERR SYMD(LEXTR                ; Yes--send message
             FBB3'     30    044A          BSBW    MAC$ERRORPT
  05 A6    0000'CF     D0    044D 50$:     MOVL    W^MAC$GL_PC,SYM$L_VAL(R6) ;SET SYMBOL VALUE
  0C A6    0000'CF     90    0453          MOVB    W^MAC$GL_PSECT,SYM$B_SEG(R6) ;SET PSECT NUMBER OF SYMBOL
        09 A6   01     A8    0459          BISW2   #SYM$M_DEF,SYM$W_FLAG(R6) ;MARK AS DEFINED
     55    0000'CF     D0    045D          MOVL    W^MAC$GL_PSECTPTR,R5      ;POINT TO CURRENT PSECT
     04 0D A5   03     E0    0462          BBS     #PSC$V_REL,PSC$W_OPTIONS(R5),60$ ;BRANCH IF RELOCATABLE
        09 A6   10     A8    0467          BISW2   #SYM$M_ABS,SYM$W_FLAG(R6) ;NO--FLAG SYMBOL AS ABSOLUTE
  09 A5    0080 8F     A8    046B 60$:     BISW2   #SYM$M_REF,PSC$W_FLAG(R5) ;MARK PSECT AS REFERENCED
                             0471          $INTOUT_LW INT$_LGLAB,R6          ;OUTPUT COMMAND TO PASS 2
     55      00'8F     9A    0479          MOVZBL  #CRF$K_DEF,R5             ;SET DEFINITION
             FB80'     31    047D          BRW     MAC$CREF_SYM              ;CREF SYMBOL IF CROSS REFERENCING
                             0480
```

```
                         0480   722          .DSABL  LSB
```

```
                          0480   724          .SBTTL  DATA GENERATION DIRECTIVES
                          0480   725
                          0480   726 ;++
                          0480   727 ; FUNCTIONAL DESCRIPTION:
                          0480   728 ;
                          0480   729 ;        BYTE/WORD/LONG/QUAD/SGNBYT/SGNWRD/OCTA ARE CALLED WHEN THE CORRESPONDING
                          0480   730 ;        DATA GENERATION DIRECTIVE IS SCANNED.  FLAGS ARE SET FOR THE
                          0480   731 ;        ROUTINES DALST2, DALST1, AND DATNUL TO PROCESS THE FOLLOWING
                          0480   732 ;        DATA ITEMS.
                          0480   733 ;
                          0480   734 ;--
                          0480   735
                          0480   736 BYTE::                                           ;DATA_TYPE = KBYTE
                00   DD   0480   737          PUSHL   #0                              ;STACK INDEX
                1F   10   0482   738          BSBB    DAT_COM                         ;GO TO COMMON ROUTINE
                     01   0484   739          .BYTE   1                               ;1 BYTE PER ITEM
                          0485   740
                          0485   741 WORD::                                           ;DATA_TYPE = KWORD
                01   DD   0485   742          PUSHL   #1                              ;STACK INDEX
                1A   10   0487   743          BSBB    DAT_COM                         ;GO TO COMMON ROUTINE
                     02   0489   744          .BYTE   2                               ;TWO BYTES PER ITEM
                          048A   745
                          048A   746 LONG::                                           ;DATA_TYPE = KLONG
                02   DD   048A   747          PUSHL   #2                              ;STACK INDEX
                15   10   048C   748          BSBB    DAT_COM                         ;GO TO COMMON ROUTINE
                     04   048E   749          .BYTE   4                               ;FOUR BYTES PER ITEM
                          048F   750
                          048F   751 QUAD::                                           ;DATA_TYPE = KQUAD
                03   DD   048F   752          PUSHL   #3                              ;STACK INDEX
                10   10   0491   753          BSBB    DAT_COM                         ;GO TO COMMON ROUTINE
                     08   0493   754          .BYTE   8                               ;EIGHT BYTES PER ITEM
                          0494   755
                          0494   756 SGNBYT::                                         ;DATA_TYPE = KSGNB
                04   DD   0494   757          PUSHL   #4                              ;STACK INDEX
                0B   10   0496   758          BSBB    DAT_COM                         ;GO TO COMMON ROUTINE
                     01   0498   759          .BYTE   1                               ;ONE BYTE PER ITEM
                          0499   760
                          0499   761 SGNWRD::                                         ;DATA_TYPE = KSGNW
                05   DD   0499   762          PUSHL   #5                              ;STACK INDEX
                06   10   049B   763          BSBB    DAT_COM                         ;GO TO COMMON ROUTINE
                     02   049D   764          .BYTE   2                               ;TWO BYTES PER ITEM
                          049E   765
                          049E   766 OCTA::                                           ;DATA_TYPE = KOCTA
                06   DD   049E   767          PUSHL   #6                              ;STACK INDEX
                01   10   04A0   768          BSBB    DAT_COM                         ;GOTO COMMON ROUTINE
                     10   04A2   769          .BYTE   16                              ;SIXTEEN BYTES PER ITEM
                          04A3   770
                          04A3   771 DAT_COM:
     0000'CF    9E   9A   04A3   772          MOVZBL  @(SP)+,W^MAC$GL_OPSIZE  ;STORE OPERAND SIZE
        0000'CF 8ED0      04A8   773          POPL    W^MAC$GL_DIRFLG         ;STORE INDEX
      00 6B     06   E3   04AD   774          BBCS    #FLG$V_EVALEXPR,(R11),.+1 ;ALLOW EXPRESSION EVALUATION
                          04B1   775 ;
                          04B1   776 ; CONTINUE ON INTO DATA_EXIT
                          04B1   777 ;
```

```
                                     04B1     779 ;++
                                     04B1     780 ; FUNCTIONAL DESCRIPTION:
                                     04B1     781 ;
                                     04B1     782 ;       'ADDRES' IS CALLED WHEN A .ADDRESS DIRECTIVE IS SCANNED.
                                     04B1     783 ;       ALL THAT IS DONE IS TO SET FLAGS AND ENSURE THAT THERE
                                     04B1     784 ;       IS ROOM IN THE INTERMEDIATE BUFFER TO CONTAIN THE EXPRESSION.
                                     04B1     785 ;
                                     04B1     786 ;--
                                     04B1     787
                                     04B1     788 ADDRES::                                        ;ADDR_TYPE = KADDRESS
                                     04B1     789 DATA_EXIT:
            0000'CF    59      D1    04B1     790         CMPL    R9,W^MAC$GL_INTWRNPT     ;NEAR THE END OF THE BUFFER?
                       03      1B    04B6     791         BLEQU   10$                      ;IF LEQ NO
                    FB45'      30    04B8     792         BSBW    MAC$OUTFRAME             ;YES--WRITE BUFFER OUT
            0000'CF    59      D0    04BB     793 10$:    MOVL    R9,W^MAC$GL_EXPPTR       ;SAVE START OF EXPRESSION
            0000'CF    59      D0    04C0     794         MOVL    R9,W^MAC$GL_EXPEND       ;AND END OF EXPRESSION
                  0000'CF      D4    04C5     795         CLRL    W^MAC$GL_ABSFLAG         ;ASSUME ABSOLUTE EXPR
                  0000'CF      D4    04C9     796         CLRL    W^MAC$GL_PRMSEG          ;ABSOLUTE SEGMENT
              00 6B    04      E5    04CD     797         BBCC    #FLG$V_DATRPT,(R11),.+1  ;NO REPEAT YET
      6B     00000084  8F      C8    04D1     798         BISL2   #FLG$M_EXPOPT!FLG$M_COMPEXPR,(R11) ;ALLOW EXPRESSION OPT.
                                     04D8     799                                          ;   AND ASSUME COMPILE TIME EXPR
                               05    04D8     800         RSB
```

```
                              04D9     802 ;++
                              04D9     803 ; FUNCTIONAL DESCRIPTION:
                              04D9     804 ;
                              04D9     805 ;       'STOADR' IS CALLED FOR EACH ITEM FOUND IN A .ADDRESS DIRECTIVE.
                              04D9     806 ;       CODE IS PUT IN THE INTERMEDIATE BUFFER TO STACK THE VALUE,
                              04D9     807 ;       AND STORE POSITION INDPENDENT DATA.  FLAGS ARE THEN INITIALIZED
                              04D9     808 ;       FOR THE NEXT ITEM.
                              04D9     809 ;
                              04D9     810 ;--
                              04D9     811
                              04D9     812 STOADR::                                  ;ADDR_LIST = EXPR ! ADDR_LIST DCOMMA EXPR
          0000'CF     D5      04D9     813         TSTL    W^MAC$GL_ABSFLAG          ;ABSOLUTE EXPRESSION?
               0E     12      04DD     814         BNEQ    10$                       ;IF NEQ NO
            FB1E'     30      04DF     815         BSBW    MAC$OPTIMIZEEXPR          ;YES--WIPE IT OUT
                              04E2     816         $INTOUT_LW INT$_STKL,<W^MAC$AL_VALSTACK[R7]> ;AND STACK THE VALUE
                              04ED     817 10$:    $INTOUT_X INT$_SPID               ;STORE PIC DATA
                              04F3     818         $INC_PC #4                        ;COUNT FOUR BYTES
             FFB6     31      04F8     819         BRW     DATA_EXIT                 ;INIT FOR NEXT ADDRESS
                              04FB     820
                              04FB     821 ;++
                              04FB     822 ; FUNCTIONAL DESCRIPTION:
                              04FB     823 ;
                              04FB     824 ;       'DATARG' IS CALLED FOR EACH ITEM IN A BYTE/WORD/LONG/QUAD
                              04FB     825 ;       DIRECTIVE.  FLAGS ARE INITIALIZED FOR THE NEXT ITEM.
                              04FB     826 ;
                              04FB     827 ;--
                              04FB     828
                              04FB     829 DATARG::                                  ;DATA_LIST = EXPR
                              04FB     830                                           ;DATA_LIST = DATA_LIST DCOMMA EXPR
          0000'CF     D5      04FB     831         TSTL    W^MAC$GL_ABSFLAG          ;ABSOLUTE EXPRESSION?
               04     13      04FF     832         BEQL    10$                       ;IF EQL YES
      00 6B    07     E5      0501     833         BBCC    #FLG$V_EXPOPT,(R11),10$ ;NO--NO OPTIMIZATION
                              0505     834 10$:
                              0505     835 ;
                              0505     836 ; THE FOLLOWING ALLOWS EVALUATION OF REPEAT COUNT
                              0505     837 ;
      00 6B    02     E3      0505     838         BBCS    #FLG$V_COMPEXPR,(R11),.+1 ;ASSUME COMPILE TIME EXPRESSION
          0000'CF     D4      0509     839         CLRL    W^MAC$GL_ABSFLAG          ;ASSUME ABSOLUTE
          0000'CF     D4      050D     840         CLRL    W^MAC$GL_PRMSEG           ;ABS PSECT
      00 6B    04     E5      0511     841         BBCC    #FLG$V_DATRPT,(R11),.+1 ;NO REPEAT COUNT YET
                      05      0515     842         RSB
                              0516     843
                              0516     844 ;++
                              0516     845 ; FUNCTIONAL DESCRIPTION:
                              0516     846 ;
                              0516     847 ;       'DATNUL' IS CALLED WHEN A NULL DATA ITEM IS FOUND IN A
                              0516     848 ;       BYTE/WORD/LONG/QUAD/OCTA DIRECTIVE.  A ZERO VALUE IS EMITTED
                              0516     849 ;       TO PASS 2 AND FLAGS  ARE INITIALIZED FOR THE NEXT ITEM.
                              0516     850 ;
                              0516     851 ;--
                              0516     852
                              0516     853 DATNUL::                                  ;DATA_STAT = DATA_TYPE <NULL>
    55    0000'CF     D0      0516     854         MOVL    W^MAC$GL_DIRFLG,R5        ;GET INDEX FOR DATA TYPE
50    00000000'E5     9A      051B     855         MOVZBL  L^DAT_NUL_CMD(R5),R0      ;GET COMMAND
               00     DD      0522     856         PUSHL   #0                        ;STACK A 0
            FAD9'     30      0524     857         BSBW    MAC$INTOUT_1_LW           ;SEND TO INT. BUFFER
53    00000031'E5     9A      0527     858         MOVZBL  L^DAT_SHIFT_FACT(R5),R3 ; Get shift factor
```

```
03    53    91  052E     859            CMPB     R3,#3                    ; Was this .QUAD or .OCTA?
      1D    19  0531     860            BLSS     10$                      ; No if LSS
                0533     861            $INTOUT_LW INT$_STIL,<#0>         ; Set bits 32-63 as zero
04    53    91  053B     862            CMPB     R3,#4                    ; Was this .OCTA?
      10    12  053E     863            BNEQ     10$                      ; No if NEQ
                0540     864            $INTOUT_LW INT$_STIL,<#0>         ; Set bits 64-95 and
                0548     865            $INTOUT_LW INT$_STIL,<#0>         ; bits 96-127 as zero
                0550     866 10$:       $INC_PC W^MAC$GL_OPSIZE           ;COUNT THE BYTES
    FF57    31  0557     867            BRW      DATA_EXIT                ;INIT FOR NEXT ITEM
```

```
                      055A  ;++
                      055A  ; FUNCTIONAL DESCRIPTION:
                      055A  ;
                      055A  ;       'DALST2' AND 'DALST1' ARE CALLED TO PROCESS THE ITEMS IN
                      055A  ;       A DATA-LIST FOR BYTE/WORD/LONG/QUAD/OCTA DIRECTIVES.  'DALST2'
                      055A  ;       IS CALLED IF THIS IS A REPEAT ITEM, AND 'DALST1' IS CALLED
                      055A  ;       IF IT IS NOT.
                      055A  ;
                      055A  ;--
                      055A
                      055A  DALST2::                                        ;DATA_ARGS = DATA_LIST DSQOPN EXPR DSQCLS
      6B   04     E3  055A          BBCS    #FLG$V_DATRPT,(R11),-   ;THIS IS REPEATED DATA
           03         055D                  DALST1
                      055E  QUDSTR::                                        ;DATA_STAT = QUAD_HEAD PRIMITIVE
                      055E  OCTSTR::                                        ;DATA_STAT = OCTA_HEAD PRIMITIVE
         FF9A     30  055E          BSBW    DATARG                          ;INIT DATA FLAGS
                      0561  DALST1::                                        ;DATA_ARGS = DATA_LIST
   55  0000'CF    D0  0561          MOVL    W^MAC$GL_DIRFLG,R5              ;GET DATA TYPE INDEX
   2D 6B   04     E1  0566          BBC     #FLG$V_DATRPT,(R11),30$ ;BRANCH IF NOT REPEAT
                      056A  ;
                      056A  ; THIS IS REPEATED DATA TYPE
                      056A  ;
       0000'CF    D5  056A          TSTL    W^MAC$GL_ABSFLAG                ;IS REPEAT COUNT ABSOLUTE?
           08     12  056E          BNEQ    10$                             ;IF NEQ NO--ERROR
  50  FFFC'CF47   D0  0570          MOVL    W^MAC$AL_VALSTACK-4[R7],R0 ;YES--GET REPEAT COUNT
           0D     11  0576          BRB     20$                             ;AND SKIP AHEAD
                      0578  10$:    $MAC_ERR RPTCNTNABS                     ; No--get error code
        FA80'     30  057D          BSBW    MAC$ERRORPT                     ;ISSUE MESSAGE TO PASS 2
      FFFC'CF47   D4  0580          CLRL    W^MAC$AL_VALSTACK-4[R7] ;DO NO REPEATING
 50  00000007'E5  9A  0585  20$:    MOVZBL  L^DAT_RPT_CMD(R5),R0        ;GET COMMAND
        FA71'     30  058C          BSBW    MAC$INTOUT_X                    ;ISSUE TO PASS 2
  50  FFFC'CF47   D0  058F          MOVL    W^MAC$AL_VALSTACK-4[R7],R0 ;GET THE REPEAT COUNT
           36     11  0595          BRB     60$                             ;FINISH UP
                      0597  ;
                      0597  ; NOT A REPEAT
                      0597  ;
   25 6B   07     E1  0597  30$:    BBC     #FLG$V_EXPOPT,(R11),40$ ;BRANCH IF NOT OPTIMIZABLE
        FA62'     30  059B          BSBW    MAC$OPTIMIZEXPR                 ;YES--WIPE OUT EXPRESSION
      0000'CF47   DD  059E          PUSHL   W^MAC$AL_VALSTACK[R7]           ;STACK THE VALUE
50  00000015'EF45 D0  05A3          MOVL    L^DAT_TRUNC_CHK[R5],R0          ;GET TRUNCATION ROUTINE CHECK ADDRESS
           02     13  05AB          BEQL    33$                             ;IF EQL NO NEED TO CHECK
           60     16  05AD          JSB     (R0)                            ;CHECK FOR TRUNCATION AND REPORT ERROR
   55  0000'CF    D0  05AF  33$:    MOVL    W^MAC$GL_DIRFLG,R5              ;RETRIEVE DATA TYPE INDEX AGAIN
 50  00000000'E5  9A  05B4          MOVZBL  L^DAT_NUL_CMD(R5),R0            ;GET THE COMMAND
        FA42'     30  05BB  35$:    BSBW    MAC$INTOUT_1_LW                 ;SEND TO INT. FILE
           0A     11  05BE          BRB     50$                             ;CONTINUE
                      05C0  ;
                      05C0  ; NOT OPTIMIZED, NOT REPEATED
                      05C0  ;
 50  0000000E'E5  9A  05C0  40$:    MOVZBL  L^DAT_STO_CMD(R5),R0            ;GET COMMAND
        FA36'     30  05C7          BSBW    MAC$INTOUT_X                    ;SEND TO INT. FILE
      50   01     9A  05CA  50$:    MOVZBL  #1,R0                           ;USE REPEAT COUNT OF 1
                      05CD  ;
                      05CD  ; FINISH UP
                      05CD  ;
 53  00000031'E5  9A  05CD  60$:    MOVZBL  L^DAT_SHIFT_FACT(R5),R3 ; Get shift factor
   50   50   53   78  05D4          ASHL    R3,R0,R0                        ; Figure total allocation
```

```
                       05D8    926          $INC_PC R0                          ;COUNT IN PASS 1
   03    53      91    05DD    927          CMPB    R3,#3                       ; Was this .QUAD or .OCTA
         24      19    05E0    928          BLSS    70$                         ; No if LSS
                       05E2    929          $INTOUT_LW INT$_STIL,<W^MAC$GL_VAL3> ; Send bits 32-63 to intermediate file
   04    53      91    05EC    930          CMPB    R3,#4                       ; Was this .OCTA?
         14      12    05EF    931          BNEQ    65$                         ; No if NEQ
                       05F1    932          $INTOUT_LW INT$_STIL,<W^MAC$GQ_VAL2+0> ; Send bits 64-95 and then
                       05FB    933          $INTOUT_LW INT$_STIL,<W^MAC$GQ_VAL2+4> ; bits 96-127 to intermediate file
                       0605    934 65$:
                 05    0605    935          RSB
       FEA8      31    0606    936 70$:     BRW     DATA_EXIT                   ;INIT FOR NEXT ELEMENT
```

```
                         0609          .SBTTL  ENTRY POINT DEFINITION DIRECTIVES
                         0609
                         0609  ;++
                         0609  ; FUNCTIONAL DESCRIPTION:
                         0609  ;
                         0609  ;       VECTR0 IS CALLED WHEN A .VECTOR DIRECTIVE WITH NO EPT MASK
                         0609  ;       IS SCANNED.
                         0609  ;
                         0609  ;--
                         0609
                         0609  VECTR0::                                ;DIRECTIVE = KVECTOR ID
                         0609          $INTOUT_LW INT$_STKEPT,<W^MAC$AL_VALSTACK[R7]> ;STACK ENTRY POINT MASK
                         0614          $INTOUT_X INT$_STOW             ; Store word
              69    11   061A          BRB     ENTRY_VEC_XIT           ;TAKE COMMON EXIT
                         061C
                         061C  ;++
                         061C  ; FUNCTIONAL DESCRIPTION:
                         061C  ;
                         061C  ;       VECTR2 AND VECTR1 ARE CALLED WHEN .VECTOR DIRECTIVES ARE
                         061C  ;       SCANNED WITH AN EPT MASK.  CODE IS EMITTED TO STACK THE
                         061C  ;       EPT AND OR IT WITH THE EXPRESSION ON THE STACK.
                         061C  ;
                         061C  ;--
                         061C
                         061C  VECTR2::                                ;DIRECTIVE = KVECTOR ID EXPR
 52    FFFC'CF47    D0   061C          MOVL    W^MAC$AL_VALSTACK-4[R7],R2 ;POINT TO SYMBOL
              06    11   0622          BRB     VEC_COM                 ;
                         0624
                         0624  VECTR1::                                ;DIRECTIVE = KVECTOR ID DCOMMA EXPR
 52    FFF8'CF47    D0   0624          MOVL    W^MAC$AL_VALSTACK-8[R7],R2 ;POINT TO SYMBOL
                         062A  VEC_COM:
                         062A          $INTOUT_LW INT$_STKEPT,R2       ;STACK EPT
                         0632          $INTOUT_X INT$_OR               ;OR WITH EXPR ON STACK
                         0638          $INTOUT_X INT$_STOW             ; Store word
              24    11   063E          BRB     ENTRY_VECTOR            ;
                         0640
                         0640  ;++
                         0640  ; FUNCTIONAL DESCRIPTION:
                         0640  ;
                         0640  ;       ENTRY1 AND ENTRY2 ARE CALLED TO PROCESS .ENTRY DIRECTIVES.  THE
                         0640  ;       ONLY DIFFERENCE BETWEEN THEM IS THAT ENTRY1 IS CALLED IF THERE
                         0640  ;       WAS A COMMA BETWEEN THE ID AND THE EXPRESSIION AND ENTRY2 IS
                         0640  ;       CALLED IF THERE WAS NO COMMA.
                         0640  ;
                         0640  ;--
                         0640
                         0640  ENTRY1::                                ;DIRECTIVE = KENTRY ID DCOMMA EXPR
 56    FFF8'CF47    D0   0640          MOVL    W^MAC$AL_VALSTACK-8[R7],R6 ;POINT TO SYMBOL BLOCK
              06    11   0646          BRB     ENTRY_COM
                         0648
                         0648  ENTRY2::                                ;DIRECTIVE = KENTRY ID EXPR
 56    FFFC'CF47    D0   0648          MOVL    W^MAC$AL_VALSTACK-4[R7],R6 ;POINT TO SYMBOL BLOCK
                         064E  ENTRY_COM:
         0204 8F    A8   064E          BISW2   #SYM$M_EPT!SYM$M_GLOBL,- ;MARK AS GLOBAL EPT
           09 A6         0652                          SYM$W_FLAG(R6)  ;...
            FDC5    30   0654          BSBW    LBL_X                   ;DEFINE LABEL
                         0657          $INTOUT_LW INT$_EPT,<R6,W^MAC$AL_VALSTACK[R7]> ;PROCESS EPT ON PASS 2
```

```
                                0664   995 ENTRY_VECTOR:
                 0000'CF   D5   0664   996         TSTL    W^MAC$GL_ABSFLAG        ;ABSOLUTE EXPR?
                      13   12   0668   997         BNEQ    10$                     ;IF NEQ NO
   0000'CF47  00003003 8F   D3  066A   998         BITL    #^X3003,W^MAC$AL_VALSTACK[R7] ;YES--ANY ILLEGAL BITS SET?
                      0F   13   0674   999         BEQL    20$                     ;IF EQL NO
                                0676  1000         $MAC_ERR ILLMASKBIT             ; Yes--get message code
                      05   11   067B  1001         BRB     15$                     ;
                                067D  1002 10$:    $MAC_ERR EMSKNOTABS             ; Entry mask not absolute
                   F97B'   30   0682  1003 15$:    BSBW    MAC$ERRORPT             ;REPORT TO PASS 2
                                0685  1004 20$:
                                0685  1005 ENTRY_VEC_XIT:
                                0685  1006         $INC_PC #2                      ;COUNT TWO BYTES
          50   00000000'EF  D0  068A  1007         MOVL    MAC$GL_PSECTPTR, R0     ;AND MARK THE PSECT AS REFERENCED.
         09 A0    0080 8F   A8  0691  1008         BISW2   #SYM$M_REF,PSC$W_FLAG(R0)
                            05  0697  1009         RSB
                                0698  1010
                                0698  1011 ;++
                                0698  1012 ; FUNCTIONAL DESCRIPTION:
                                0698  1013 ;
                                0698  1014 ;       THIS ROUTINE IS CALLED TO PROCESS THE .TRANSFER DIRECTIVE.
                                0698  1015 ;       CODE IS EMITTED TO PASS 2 TO SEND A REDEFINITION COMMAND
                                0698  1016 ;       TO THE LINKER.
                                0698  1017 ;
                                0698  1018 ;--
                                0698  1019
                                0698  1020 XFER::                                                  ;DIRECTIVE = KXFER ID
                                0698  1021         $INTOUT_LW INT$_REDEF,<W^MAC$AL_VALSTACK[R7]>   ;TELL PASS 2
          50   00000000'EF  D0  06A3  1022         MOVL     MAC$GL_PSECTPTR, R0                    ;AND MARK THE PSECT AS REFER
             01      0C A0  91  06AA  1023         CMPB    PSC$B_SEG(R0), #1                       ;ARE WE DEALING WITH
                        06  12  06AE  1024         BNEQ    10$                                     ;THE BLANK PSECT?
         09 A0    0080 8F   A8  06B0  1025         BISW2   #SYM$M_REF,PSC$W_FLAG(R0)               ;YES MARK IT AS REFERENCED.
                            05  06B6  1026 10$:    RSB
                                06B7  1027
                                06B7  1028         .END
```

```
$COUNT         = 0000003B               CHR$V_SPA_MSK    = 00000000             FLG$M_MOREARG  = 00002000
AB             = 00000001               CHR$V_SYM_CH1    = 00000003             FLG$M_MOREINP  = 00000008
AD             = 0000C008               CHR$V_SYM_CHR    = 00000002             FLG$M_NEWPND   = 00000400
ADDRES           000004B1 RG    04      CHR$V_SYM_DLM    = 00000001             FLG$M_NOREF    = 01000000
ADM$_ABSOLUTE  = 00000002               CNT              = 00000001             FLG$M_NTYPEPC  = 00000020
ADM$_BYTE_DISP = 0000000A               CR               = 0000000D             FLG$M_NULCHR   = 00040000
ADM$_DFBYTEDISP= 0000000B               CRF$K_DEF          ********  X    04    FLG$M_OBJXST   = 00200000
ADM$_DFLONGDISP= 0000000F               D                = 0000C008             FLG$M_OPNDCHK  = 00000100
ADM$_DFRAUTOINC= 00000009               DALST1             00000561 RG    04    FLG$M_OPRND    = 00002000
ADM$_DFWORDDISP= 0000000D               DALST2             0000055A RG    04    FLG$M_OPTVFLIDX= 00001000
ADM$_IMMEDIATE = 00000001               DATARG             000004FB RG    04    FLG$M_ORDLST   = 00020000
ADM$_INDEX     = 00000004               DATA_EXIT          000004B1 R     04    FLG$M_P2       = 00004000
ADM$_LITERAL   = 00000000               DATNUL             00000516 RG    04    FLG$M_RPTIRP   = 10000000
ADM$_LONG_DISP = 0000000E               DAT_COM            000004A3 R     04    FLG$M_SEQFIL   = 02000000
ADM$_MAXMOD    = 0000000F               DAT_NUL_CMD        00000000 R     03    FLG$M_SKAN     = 00008000
ADM$_PIC       = 0C000003               DAT_RPT_CMD        00000007 R     03    FLG$M_SPECOP   = 00000004
ADM$_REGAUTODEC= 00000007               DAT_SHIFT_FACT     00000031 R     03    FLG$M_SPLALL   = 04000000
ADM$_REGAUTOINC= 00000008               DAT_STO_CMD        0000000E R     03    FLG$M_STOIMF   = 00040000
ADM$_REGISTER  = 00000005               DAT_TRUNC_CHK      00000015 R     03    FLG$M_SYM2COL  = 00000400
ADM$_RRIND     = 00000006               ENB$G_DEBUG        ********  X    04    FLG$M_TOCFLG   = 00080000
ADM$_WORD_DISP = 0000000C               ENB$G_LOCALSYMB    ********  X    04    FLG$M_UPAFLG   = 00000010
AF             = 00008004               ENB$G_SUPPRESS     ********  X    04    FLG$M_UPDFIL   = 00000080
AG             = 0000A008               ENTRY1             00000640 RG    04    FLG$M_UPMARG   = 00000040
AH             = 00009010               ENTRY2             00000648 RG    04    FLG$M_XCRF     = 80000000
AL             = 00000004               ENTRY_COM          0000064E R     04    FLG$V_ALLCHR   = 00000000
AO             = 00000010               ENTRY_VECTOR       00000664 R     04    FLG$V_BOL      = 00000001
AQ             = 00000008               ENTPY_VEC_XIT      00000685 R     04    FLG$V_CHKLPND  = 00000014
ARG$K_SIZE     = 000003E8               ERR              = 00000000             FLG$V_COMPEXPR = 00000002
ASSGNT           00000285 RG    04      F                = 00008004             FLG$V_CONT     = 00000003
ASSHD1           0000023C RG    04      FF               = 0000000C             FLG$V_CRF      = 0000001E
ASSHD2           0000022A RG    04      FLG$M_ALLCHR     = 00000001             FLG$V_CRSEEN   = 00000020
ASSHD3           00000224 RG    04      FLG$M_BOL        = 00000002             FLG$V_DATRPT   = 00000004
ASSIGN_HEAD      00000242 R     04      FLG$M_CHKLPND    = 00100000             FLG$V_DBGOUT   = 0000002E
AUD$K_SIZE     = 00000010               FLG$M_COMPEXPR   = 00000004             FLG$V_DLIMSTR  = 0000002F
AW             = 00000002               FLG$M_CONT       = 00000008             FLG$V_ENDMCH   = 00000005
B              = 00000001               FLG$M_CRF        = 40000000             FLG$V_EVALEXPR = 00000006
BLKBYT           0000039A RG    04      FLG$M_CRSEEN     = 00000001             FLG$V_EXPOPT   = 00000007
BLKLNG           000003A0 RG    04      FLG$M_DATRPT     = 00000010             FLG$V_EXTERR   = 00000030
BLKOCT           000003A6 RG    04      FLG$M_DBGOUT     = 00004000             FLG$V_EXTWRN   = 00000031
BLKQUD           000003A3 RG    04      FLG$M_DLIMSTR    = 00008000             FLG$V_FIRSTLN  = 00000029
BLKWRD           0000039D RG    04      FLG$M_ENDMCH     = 00000020             FLG$V_IFSTAT   = 00000017
BLNK           = 00000020               FLG$M_EVALEXPR   = 00000040             FLG$V_IIF      = 00000016
BSTAT1           000003BA RG    04      FLG$M_EXPOPT     = 00000080             FLG$V_INSERT   = 00000008
BSTAT2           000003C5 RG    04      FLG$M_EXTERR     = 00010000             FLG$V_IRPC     = 0000001D
BYTE             00000480 RG    04      FLG$M_EXTWRN     = 00020000             FLG$V_LEXOP    = 00000021
CHR$M_COMMA_CR = 00000020               FLG$M_FIRSTLN    = 00000200             FLG$V_LSTXST   = 00000009
CHR$M_ILL_CHR  = 00000040               FLG$M_IFSTAT     = 00800000             FLG$V_MAC2COL  = 0000002B
CHR$M_NUM_BER  = 00000010               FLG$M_IIF        = 00400000             FLG$V_MACL     = 0000000B
CHR$M_SPA_MSK  = 00000001               FLG$M_INSERT     = 00000100             FLG$V_MACLTB   = 0000001B
CHR$M_SYM_CH1  = 00000008               FLG$M_IRPC       = 20000000             FLG$V_MACTXT   = 00000010
CHR$M_SYM_CHR  = 00000004               FLG$M_LEXOP      = 00000002             FLG$V_MEBLST   = 0000000C
CHR$M_SYM_DLM  = 00000002               FLG$M_LSTXST     = 00000200             FLG$V_MOREARG  = 0000002D
CHR$V_COMMA_CR = 00000005               FLG$M_MAC2COL    = 00000800             FLG$V_MOREINP  = 00000023
CHR$V_CVTLWC   = 00000061               FLG$M_MACL       = 00000800             FLG$V_NEWPND   = 0000000A
CHR$V_ILL_CHR  = 00000006               FLG$M_MACLTB     = 08000000             FLG$V_NOREF    = 00000018
CHR$V_NOCVT    = 0000007F               FLG$M_MACTXT     = 00010000             FLG$V_NTYPEPC  = 00000025
CHR$V_NUM_BER  = 00000004               FLG$M_MEBLST     = 00001000             FLG$V_NULCHR   = 00000032
```

```
FLG$V_OBJXST   = 00000015               INT$_SBTTL     = 00000021                MAC$GL_HIGH_32   ********    X  04
FLG$V_OPNDCHK  = 00000028               INT$_SETFLAG   = 00000022                MAC$GL_INTWRNPT  ********    X  04
FLG$V_OPRND    = 0000000D               INT$_SETLONG   = 00000023                MAC$GL_LINBAS    ********    X  04
FLG$V_OPTVFLIDX= 0000002C               INT$_SPIC      = 00000024                MAC$GL_LINENUM   ********    X  04
FLG$V_ORDLST   = 00000011               INT$_SPID      = 00000025                MAC$GL_MOPNUM    ********    X  04
FLG$V_P2       = 0000000E               INT$_STIB      = 00000026                MAC$GL_MOPPTR    ********    X  04
FLG$V_RPTIRP   = 0000001C               INT$_STIL      = 00000028                MAC$GL_OPSIZE    ********    X  04
FLG$V_SEQFIL   = 00000019               INT$_STIW      = 00000027                MAC$GL_PC        ********    X  04
FLG$V_SKAN     = 0000000F               INT$_STKEPT    = 00000029                MAC$GL_PRMSEG    ********    X  04
FLG$V_SPECOP   = 00000022               INT$_STKG      = 0000002A                MAC$GL_PSECT     ********    X  04
FLG$V_SPLALL   = 0000001A               INT$_STKL      = 0000002B                MAC$GL_PSECTPTR  ********    X  04
FLG$V_STOIMF   = 00000012               INT$_STKPC     = 0000002C                MAC$GL_RECHDBUF  ********    X  04
FLG$V_SYM2COL  = 0000002A               INT$_STKS      = 0000002D                MAC$GL_SAVE_PC   ********    X  04
FLG$V_TOCFLG   = 00000013               INT$_STOB      = 00000034                MAC$GL_SAV_BAS   ********    X  04
FLG$V_UPAFLG   = 00000024               INT$_STOL      = 0000002E                MAC$GL_SAV_LIN   ********    X  04
FLG$V_UPDFIL   = 00000027               INT$_STOW      = 00000035                MAC$GL_SAV_PAG   ********    X  04
FLG$V_UPMARG   = 00000026               INT$_STRB      = 0000002F                MAC$GL_SRCPAG    ********    X  04
FLG$V_XCRF     = 0000001F               INT$_STRL      = 00000031                MAC$GL_VAL3      ********    X  04
G              = 0000A008               INT$_STRSB     = 00000032                MAC$GL_VALUE     ********    X  04
H              = 00009010               INT$_STRSW     = 00000033                MAC$GQ_HIGH_64   ********    X  04
HASHSZ         = 0000007F               INT$_STRW      = 00000030                MAC$GQ_VAL2      ********    X  04
HYPHEN         = 0000002D               INT$_STSB      = 00000036                MAC$INTOUT_1_LW  ********    X  04
INP$K_BUFSIZ   = 000003E8               INT$_STSW      = 00000037                MAC$INTOUT_2_LW  ********    X  04
INT$K_BUFSIZ   = 000013F4               INT$_SUB       = 0000000A                MAC$INTOUT_ASN   0000035B RG    04
INT$K_BUFWRN   = 00001390               INT$_SUME      = 00000039                MAC$INTOUT_N     ********    X  04
INT$_ADD       = 00000001               INT$_WRN       = 00000038                MAC$INTOUT_WD    ********    X  04
INT$_AND       = 00000002               INT$_XOR       = 0000000B                MAC$INTOUT_X     ********    X  04
INT$_ASH       = 00000003               L              = 00000004                MAC$MUL_DEF_CHK  0000037C RG    04
INT$_ASN       = 0000000C               LBL1             00000416 RG    04       MAC$OPTIMIZEXPR  ********    X  04
INT$_AUGPC     = 0000000D               LBL2             00000404 RG    04       MAC$OUTFRAME     ********    X  04
INT$_BDST      = 0000000E               LBL_X            0000041C R     04       MAC$SET_NEW_LSB  ********    X  04
INT$_CHKL      = 0000000F               LONG             0000048A RG    04       MAC$SET_PC       ********    X  04
INT$_DIV       = 00000004               LST$K_BUFSIZ   = 00000086                MAC$_ASGNMNTSYN= 007D9022
INT$_END       = 00000010               LST$K_L_P_PAGE = 0000003C                MAC$_BLKEXPNABS= 007D904A
INT$_EPT       = 00000011               LST$K_TITLE_SIZ= 00000028                MAC$_EMSKNOTABS= 007D9072
INT$_ERR       = 00000012               MAC$AB_LINEBF    ********    X  04       MAC$_ILLBRDEST = 007D90BA
INT$_ETX       = 00000013               MAC$AL_VALSTACK  ********    X  04       MAC$_ILLMASKBIT= 007D90FA
INT$_FNEWL     = 00000014               MAC$AW_ILLMODTB  ********    X  04       MAC$_ILLMODE   = 007D9102
INT$_ILG       = 00000000               MAC$CK_BYT_TRU1  ********    X  03       MAC$_MULDEFLBL = 007D915A
INT$_INFO      = 0000003A               MAC$CK_SBY_TRU1  ********    X  03       MAC$_NOTENUFOPR= 007D917A
INT$_LGLAB     = 00000015               MAC$CK_SWD_TRU1  ********    X  03       MAC$_OPRNDSYNX = 007D91A2
INT$_MACL      = 00000016               MAC$CK_WRD_TRU1  ********    X  03       MAC$_RPTCNTNABS= 007D91D2
INT$_MUL       = 00000005               MAC$CREF_OPCODE  ********    X  04       MAC$_SYMDCLEXTR= 007D91DA
INT$_NEG       = 00000006               MAC$CREF_SYM     ********    X  04       MAC$_TOOMNYOPND= 007D9202
INT$_NEWL      = 00000017               MAC$ERRORPT      ********    X  04       MACH_OP_EXIT     0000003A R     04
INT$_NEWP      = 00000018               MAC$ERRORPX      ********    X  04       MAC_SUBSYS     = 0000007D
INT$_NOT       = 00000007               MAC$GB_MODE      ********    X  04       MB             = 00000041
INT$_OP        = 00000019               MAC$GB_RDXNDX    ********    X  04       MD             = 0000C048
INT$_OR        = 00000008               MAC$GB_REG       ********    X  04       MF             = 00008044
INT$_PRIL      = 0000001A               MAC$GB_VAL3      ********    X  04       MG             = 0000A048
INT$_PRT       = 0000001B               MAC$GL_ABSFLAG   ********    X  04       MH             = 00009050
INT$_PSECT     = 0000001C               MAC$GL_ASNPTR    ********    X  04       MINST1           0000000F RG    04
INT$_REDEF     = 0000001D               MAC$GL_DIRFLG    ********    X  04       ML             = 00000044
INT$_REF       = 0000001E               MAC$GL_ERRPTX    ********    X  04       MO             = 00000050
INT$_REST      = 0000001F               MAC$GL_EXPEND    ********    X  04       MQ             = 00000048
INT$_SAME      = 00000009               MAC$GL_EXPOPVL1  ********    X  04       MW             = 00000042
INT$_SAVE      = 00000020               MAC$GL_EXPPTR    ********    X  04       O              = 00000010
```

```
OBJ$K_BUFSIZ   = 00000200             PSC$M_QUAD     = 00004C00             SYM$L_VAL        00000005
OCTA             )000049E RG     04   PSC$M_RD       = 00000080             SYM$M_ABS      = 00000010
OCTSTR           0000055E RG     04   PSC$M_REL      = 00000008             SYM$M_ASN      = 00000100
OPD$M_ADDR     = 00000000             PSC$M_SHR      = 00000020             SYM$M_CRFO     = 00002000
OPD$M_BB       = 000000A1             PSC$M_USR      = FFFFFFFD             SYM$M_DEBUG    = 00000020
OPD$M_BW       = 000000C2             PSC$M_VEC      = 00000200             SYM$M_DEF      = 00000001
OPD$M_D_FLOAT  = 0000C000             PSC$M_WORD     = 00004400             SYM$M_DELMAC   = 00000200
OPD$M_FLOAT    = 00008000             PSC$M_WRT      = 00000180             SYM$M_EPT      = 00000200
OPD$M_G_FLOAT  = 0000A000             PSC$S_ALIGNMENT= 00000004             SYM$M_EXTRN    = 00000008
OPD$M_H_FLOAT  = 00009000             PSC$V_ALIGNFLG = 0000000E             SYM$M_GLOBL    = 00000004
OPD$M_MODE     = 000003E0             PSC$V_ALIGNMENT= 0000000A             SYM$M_LOCAL    = 00000040
OPD$M_MODIFY   = 00000040             PSC$V_EXE      = 00000006             SYM$M_ODBG     = 00000400
OPD$M_NOT_32F  = 00007000             PSC$V_GBL      = 00000004             SYM$M_REF      = 00000080
OPD$M_READ     = 00000020             PSC$V_LIB      = 00000001             SYM$M_RELPSECT = 00000800
OPD$M_VIELD    = 00000080             PSC$V_OVR      = 00000002             SYM$M_SUPR     = 00004000
OPD$M_WRITE    = 00000060             PSC$V_PIC      = 00000000             SYM$M_WEAK     = 00000002
OPD S_MODE     = 00000005             PSC$V_RD       = 00000007             SYM$M_XCRF     = 00001000
OPD$S_SIZE     = 00000005             PSC$V_REL      = 00000003             SYM$V_ABS      = 00000004
OPD$V_D_FLOAT  = 0000000E             PSC$V_SHR      = 00000005             SYM$V_ASN      = 00000008
OPD$V_FLOAT    = 0000000F             PSC$V_VEC      = 00000009             SYM$V_CRFO     = 0000000D
OPD$V_G_FLOAT  = 0000000D             PSC$V_WRT      = 00000008             SYM$V_DEBUG    = 00000005
OPD$V_H_FLOAT  = 0000000C             PSC$W_FLAG       00000009             SYM$V_DEF      = 00000000
OPD$V_MODE     = 00000005             PSC$W_OPTIONS    0000000D             SYM$V_DELMAC   = 00000009
OPD$V_SIZE     = 00000000             Q              = 00000008             SYM$V_EPT      = 00000009
OPF$M_LASTOPR  = 00002000             QUAD             0000048F RG     04   SYM$V_EXTRN    = 00000003
OPF$M_OPTEXP   = 00001000             QUDSTR           0000055E RG     04   SYM$V_GLOBL    = 00000002
OPF$V_LASTOPR  = 0000000D             RB             = 00000021             SYM$V_LOCAL    = 00000006
OPF$V_OPTEXP   = 0000000C             RD             = 0000C028             SYM$V_ODBG     = 0000000A
OPRAND           0000008C RG     04   RDX$V_BINARY   = 00000000             SYM$V_REF      = 00000007
PSC$B_NAME       00000004             RDX$V_DECIMAL  = 00000002             SYM$V_RELPSECT = 0000000B
PSC$B_SEG        0000000C             RDX$V_DOUBLE   = 00000005             SYM$V_SUPR     = 0000000E
PSC$B_UNUSED     0000000B             RDX$V_FLOAT    = 00000004             SYM$V_WEAK     = 00000001
PSC$K_BLKSIZ     00000013             RDX$V_GFLOAT   = 00000006             SYM$V_XCRF     = 0000000C
PSC$K_NO_OPTNS = 0000000A             RDX$V_HEX      = 00000003             SYM$W_FLAG       00000009
PSC$L_CURLOC     0000000F             RDX$V_HFLOAT   = 00000007             TAB            = 00000009
PSC$L_LINK       00000000             RDX$V_OCTAL    = 00000001             VB             = 00000081
PSC$L_MAXLGTH    00000005             REG$_PC        = 0000000F             VD             = 0000C088
PSC$M_ABS      = FFFFFFF7             RF             = 00008024             VECTR0           00000609 RG     04
PSC$M_ALIGNFLG = 00004000             RG             = 0000A028             VECTR1           00000624 RG     04
PSC$M_ALLOPTNS = 000003FF             RH             = 00009030             VECTR2           0000061C RG     04
PSC$M_BYTE     = 00004000             RL             = 00000024             VEC_COM          0000062A R      04
PSC$M_CON      = FFFFFFFB             RO             = 00000030             VF             = 00008084
PSC$M_DEFAULT  = 000001C8             RQ             = 00000028             VG             = 0000A088
PSC$M_EXE      = 000000C0             RW             = 00000022             VH             = 00009090
PSC$M_GBL      = 00000010             SEMI           = 0000003B             VL             = 00000084
PSC$M_LCL      = FFFFFFEF             SGNBYT           00000494 RG     04   VO             = 00000090
PSC$M_LIB      = 00000002             SGNWRD           00000499 RG     04   VQ             = 00000088
PSC$M_LONG     = 00004800             STAT1            00000000 RG     04   VW             = 00000082
PSC$M_NOEXE    = FFFFFFBF             STB$K_PG_MISS  = 0000000A             W              = 00000002
PSC$M_NOPIC    = FFFFFFFE             STOADR           000004D9 RG     04   WB             = 00000061
PSC$M_NORD     = FFFFFF7F             SYM$B_NAME       00000004             WD             = 0000C068
PSC$M_NOSHR    = FFFFFFDF             SYM$B_SEG        0000000C             WF             = 00008064
PSC$M_NOVEC    = FFFFFDFF             SYM$B_TOKEN      0000000B             WG             = 0000A068
PSC$M_NOWRT    = FFFFFEFF             SYM$K_BLKSIZ     0000000D             WH             = 00009070
PSC$M_OVR      = 00000004             SYM$K_MAXLEN   = 0000001F             WL             = 00000064
PSC$M_PAGE     = 00006400             SYM$K_TWOCOL   = 00000010             WO             = 00000070
PSC$M_PIC      = 00000001             SYM$L_LINK       00000000             WORD             00000485 RG     04
```

```
WQ              = 00000068
WW              = 00000062
X               = 00000010
X1              = 00000033
X2              = 00080000
XFER              00000698 RG    04

                                        +----------------+
                                        ! Psect synopsis !
                                        +----------------+

PSECT name                     Allocation          PSECT No.  Attributes
----------                     ----------          ---------  ----------
.  ABS  .                      00000000  (     0.)  00 (  0.)  NOPIC    USR    CON    ABS    LCL NOSHR NOEXE NORD   NOWRT NOVEC BYTE
. BLANK .                      00000000  (     0.)  01 (  1.)  NOPIC    USR    CON    REL    LCL NOSHR   EXE   RD     WRT NOVEC BYTE
$ABS$                          00000013  (    19.)  02 (  2.)  NOPIC    USR    CON    ABS    LCL NOSHR   EXE   RD     WRT NOVEC BYTE
MAC$RO_DATA                    00000038  (    56.)  03 (  3.)  NOPIC    USR    CON    REL    GBL NOSHR NOEXE   RD   NOWRT NOVEC LONG
MAC$RO_CODE_P1                 000006B7  (  1719.)  04 (  4.)  NOPIC    USR    CON    REL    GBL NOSHR   EXE   RD   NOWRT NOVEC LONG

                                     +------------------------+
                                     ! Performance indicators !
                                     +------------------------+

Phase                    Page faults    CPU Time       Elapsed Time
-----                    -----------    --------       ------------
Initialization                    29    00:00:00.02    00:00:02.02
Command processing               103    00:00:00.36    00:00:03.48
Pass 1                           259    00:00:05.02    00:00:25.63
Symbol table sort                  0    00:00:00.60    00:00:02.90
Pass 2                           196    00:00:01.77    00:00:06.58
Symbol table output               43    00:00:00.22    00:00:01.00
Psect synopsis output              2    00:00:00.02    00:00:00.02
Cross-reference output             0    00:00:00.00    00:00:00.00
Assembler run totals             634    00:00:08.01    00:00:41.63

The working set limit was 1350 pages.
48829 bytes (96 pages) of virtual memory were used to buffer the intermediate code.
There were 40 pages of symbol table space allocated to hold 587 non-local and 67 local symbols.
1028 source lines were read in Pass 1, producing 29 object records in Pass 2.
21 pages of virtual memory were used to define 17 macros.

                                    +--------------------------+
                                    ! Macro library statistics !
                                    +--------------------------+

Macro library name                          Macros defined
------------------                          --------------
_$255$DUA28:[MACRO.OBJ]MACRO.MLB;1                 15
_$255$DUA28:[SYSLIB]STARLET.MLB;2                   3
TOTALS (all libraries)                             18

625 GETS were required to define 18 macros.

There were no errors, warnings or information messages.

MACRO/LIS=LIS$:ACTSTA/OBJ=OBJ$:ACTSTA MSRC$:ACTSTA/UPDATE=(ENH$:ACTSTA)+LIB$:MACRO/LIB
```

0224 AH-BT13A-SE
VAX/VMS V4.0

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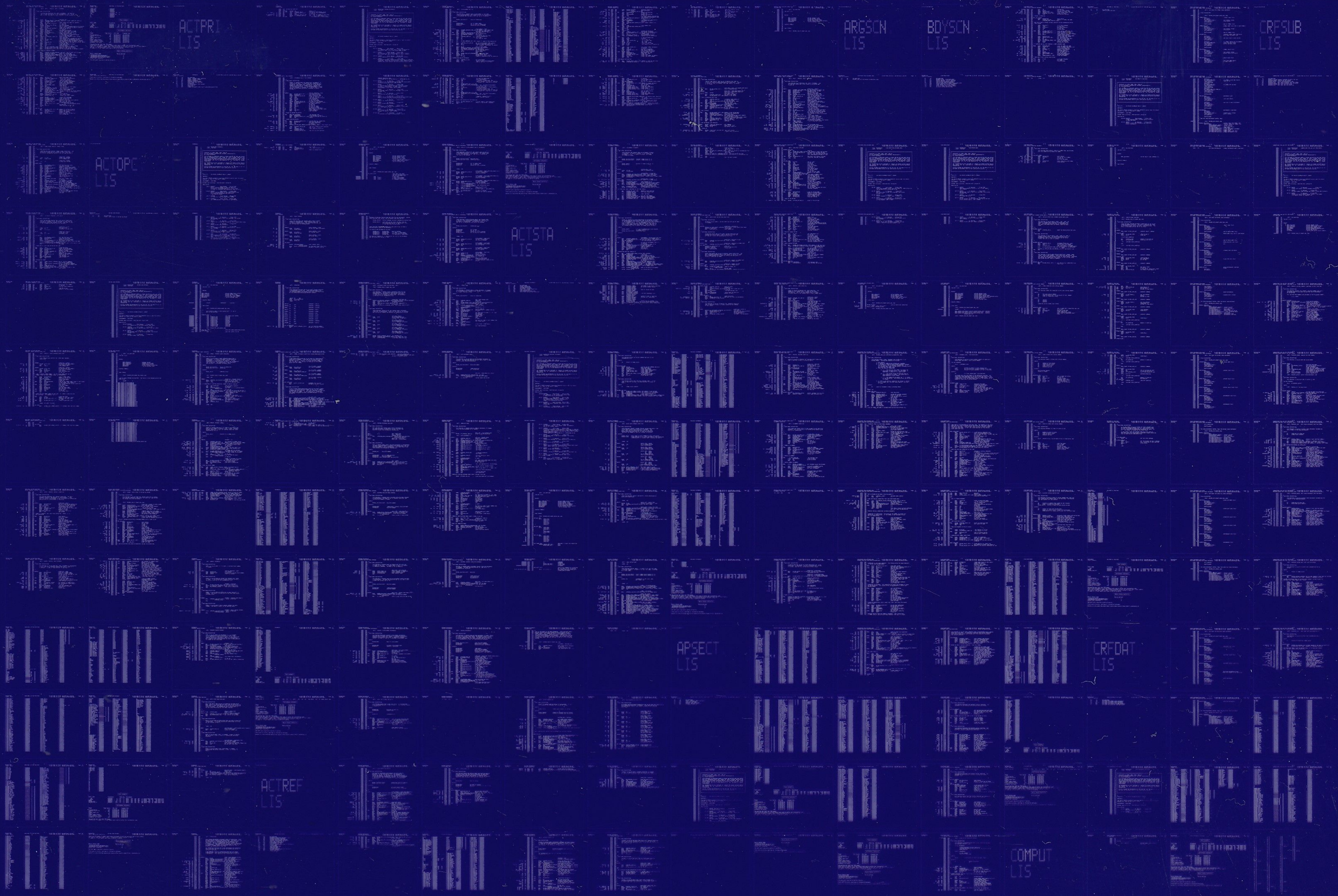

ACTPRI
LIS

ARGSCN
LIS

BDYSCN
LIS

CRFSUB
LIS

ACTOPC
LIS

ACTSTA
LIS

APSECT
LIS

CRFDAT
LIS

ACTREF
LIS

COMPUT
LIS